Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

April 24, 2012

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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

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Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
2011 Annual Environmental Operating Report

In accordance with Section 5.4.1.2 of the St. Lucie Units 1 and 2 Environmental Protection Plans (EPP), attached is the Annual Environmental Operating Report for calendar year 2011.

Sincerely,

Eric S. Katzman
Licensing Manager
St. Lucie Plant

ESK/tlt

Attachment: Florida Power & Light Company St. Lucie Plant Annual Environmental Operating Report 2011 (65 pages)

cc: FDEP Siting Office

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NRR

FLORIDA POWER & LIGHT COMPANY

ST. LUCIE PLANT

ANNUAL ENVIRONMENTAL

OPERATING REPORT

2011

FLORIDA POWER & LIGHT COMPANY

JUNO BEACH, FLORIDA

&

INWATER RESEARCH GROUP, INC.

JENSEN BEACH, FLORIDA

ENVIRONMENTAL OPERATING REPORT

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PART I

1.0 INTRODUCTION

1.1 AREA DESCRIPTION

The St. Lucie Plant is located on a 457-hectare site on Hutchinson Island on Florida's east coast (Figures 1 and 2). The plant is approximately midway between Ft. Pierce and St. Lucie Inlets. It is bounded on the east side by the Atlantic Ocean and on the west side by the Indian River Lagoon. Hutchinson Island is a barrier island that extends 36 km between inlets and attains its maximum width of 2 km at the plant site. Elevations approach five meters atop dunes bordering the beach and decrease to sea level in the mangrove swamps that are common on the western side. The Atlantic shoreline of Hutchinson Island is composed of sand and shell hash with intermittent rocky promontories protruding through the beach face along the southern end of the island. Submerged coquinoid rock formations parallel much of the island off the ocean beaches. The ocean bottom immediately offshore from the plant site consists primarily of sand and shell sediments. The Gulf Stream (Florida Current), which flows parallel to the continental shelf margin, begins to diverge from the coastline at West Palm Beach. At Hutchinson Island, the current is approximately 33 km offshore. Oceanic water associated with the western boundary of the current periodically meanders over the inner shelf, especially during summer months.

1.2 POWER PLANT DESCRIPTION

The St. Lucie Power Plant is an electric generating station on Hutchinson Island in St. Lucie County, Florida. The plant consists of two 850 net MWe nuclear-fueled electric generating units that use nearshore ocean waters for the plant's once-through condenser cooling system. Unit 1 was placed on-line in March 1976 and Unit 2 in April 1983. Water for this system enters through three submerged intake structures located about 365 m offshore (Figure 2). The intake structures are equipped with a velocity cap to minimize fish entrainment. Water passes through these structures and into submerged pipes (two 3.7 m and one 4.9 m in diameter) running under the beach. It then passes into a 1,500 m long intake canal, which transports it to the plant. After passing through the plant, the heated water is discharged into a 670 m long canal that leads to two buried discharge pipelines. These pass underneath the

dunes and along the ocean floor to the submerged discharges, the first of which is approximately 365 m offshore and 730 m north of the intake.

1.3 BACKGROUND

St. Lucie Units 1 and 2 use the Atlantic Ocean as a source of water for once through condenser cooling. Since 1971, the potential environmental effects resulting from the intake and discharge of this water have been the subject of FPL sponsored biotic studies at the site (ABI 1978, 1980, 1986-89, 1994). Jurisdiction for sea turtle studies lies with the NRC, which is considered to be the lead federal agency relative to consultation under the Endangered Species Act. This document has been prepared to satisfy the requirements contained in Appendix B, Environmental Protection Plan (EPP); St. Lucie Units 1 and 2 Facility Operating Licenses No. DPR-67 and No. NPF-16. Previous results dealing with sea turtle studies are contained in twenty-eight annual environmental operating reports covering the period from 1983 through 2010. This report describes the 2011 environmental protection activities related to sea turtles, as required by Subsection 4.2 of the St. Lucie Units 1 and 2 Environmental Protection Plans. Other routine annual reporting requirements are addressed in Part III.

1.4 SEA TURTLE NESTING SURVEY SUMMARY

Hutchinson Island, Florida, is an important rookery for loggerhead turtles (*Caretta caretta*), and also supports nesting of green turtles (*Chelonia mydas*) and leatherback turtles (*Dermochelys coriacea*). The federal government has classified the loggerhead turtle as a threatened species under the Endangered Species Act of 1973. Leatherbacks and the Florida nesting population of green turtles are listed under the Act as endangered. Due to the endangered status of these marine turtles, one of FPL's prime environmental concerns is to ensure the operation of the St. Lucie Plant does not adversely affect the Hutchinson Island rookery. Because of this concern, FPL has sponsored monitoring of marine turtle nesting activity on the island since 1971.

Daytime surveys to quantify nesting, as well as nighttime turtle tagging programs, were conducted in odd numbered years from 1971 through 1979. During daytime nesting surveys,

nine 1.25 km-long survey areas were monitored five days per week (Figure 3). The St. Lucie Plant began operation in 1976; therefore, the first three survey years (1971, 1973, and 1975) provided baseline data for nesting activity on Hutchinson Island. Though the power plant was not operating during 1975, St. Lucie Plant Unit 1 ocean intake and discharge structures were installed during that year. Installation of these structures included nighttime construction activities conducted offshore from and perpendicular to the beach. The plant was in full operation during the 1977 and 1979 surveys.

A modified daytime nesting survey was conducted in 1980 during the preliminary construction of the ocean discharge structure for St. Lucie Plant Unit 2. During this study, four of the previously established 1.25 km-long survey areas were monitored and to mitigate any adverse effects associated with construction activities, turtle nests proximal to the construction area were relocated.

Every year from 1981 through 2011, 36 one-km-long survey areas comprising the entire island were monitored seven days a week during the nesting season (Figure 3). Since the 1994 nesting season, the southern half of the island has been surveyed by Ecological Associates of Jensen Beach, Florida, and their data are included in this report. The St. Lucie Plant Unit 2 discharge structure was installed during the 1981 nesting season. Construction of the Unit 2 intake structure proceeded throughout the 1982 nesting season and was completed near the end of the 1983 nesting season. Mitigation activities associated with installation of both structures were similar to those conducted when Unit 1 intake and discharge structures were installed. Eggs from turtle nests potentially threatened by construction activities were relocated.

During 1991, another major offshore construction project was undertaken to replace damaged velocity caps on the three intake structures. A large elevated platform, from which repair activities were conducted, was erected around the three structures. Construction occurred throughout the nesting season. However, in contrast to previous offshore projects, work was restricted almost entirely to daylight hours, nighttime lighting of the work area was minimal, and no equipment or materials were used on the beach. A sea turtle protection plan, implemented in support of the project, included caging of nests along a 1,500 m section of

beach (west of the platform) and the release of hatchlings to unaffected areas to the north and south. This plan was intended to mitigate any negative effects resulting from the required safety and navigational lighting on and near the platform.

Requirement 4.2.1 of the St. Lucie Unit 2 operating license Appendix B, Environmental Protection Plan, was complete with submission of the 1986 nesting survey data (ABI, 1987). The nesting survey was continued voluntarily through 1998 with agreement from federal and state agencies. In 1998, the continuation of the nesting survey program was mandated as part of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service. An amendment to the Environmental Protection Plan was approved in 1999 to include these requirements.

1.4.1 Loggerhead Sea Turtle Nesting

The loggerhead turtle inhabits temperate, subtropical and tropical waters of the Atlantic, Pacific, and Indian Oceans. Most nesting occurs on warm temperate and subtropical beaches (Dodd, 1988). Approximately 42,000 to 74,000 loggerhead turtle nests are deposited annually on southern Florida beaches (TEWG, 2000), ranking this loggerhead turtle rookery the second largest in the world (NMFS and USFWS, 1991a). The beaches in southeast Florida are especially prolific nesting areas, with Hutchinson Island being a critically important nesting beach (Meylan et al., 1995). Between 4,000 and 8,000 loggerhead nests have been deposited annually on Hutchinson Island during the last eighteen years.

Nesting surveys on Hutchinson Island were initiated in response to concerns that the operation of the St. Lucie Plant might negatively impact the local sea turtle rookery. Previous analysis, using log-likelihood tests of independence (G-test; Sokal and Rohlf, 1981) demonstrated that the construction of the plant's offshore intake and discharge structures significantly reduced nesting at the plant site during construction years - 1975, 1981, 1982, and 1983 (ABI, 1987). However, nesting at the plant consistently returned to levels similar to or greater than those at a control site in years following the construction. During 1991, when offshore construction was restricted almost entirely to daylight hours, nests were more abundant at the plant site

than at the control site. Data collected through 2011 have shown that power plant operation exclusive of nighttime intake/discharge construction has had no apparent effect on nesting.

From 1981 through 2011, 36 one-km-long segments comprising the island's coastline have been surveyed (Figure 3). The distribution of nests among these 36 survey areas depicts an increase in nesting from north to south along the northern half of the island (ABI, 1987-1993, Figure 4). Though beach dynamics may sometimes affect the selection of nesting sites by loggerhead turtles, relationships between spatial nesting patterns and specific environmental conditions are often difficult to establish.

Not all ventures onto the beach by a female turtle culminate in successful nests. These "false crawls" (non-nesting emergences) may occur for many reasons and are commonly encountered at other rookeries. Davis and Whiting (1977) suggested that relatively high percentages of false crawls may reflect disturbances or unsatisfactory nesting beach characteristics. This means that while certain factors may affect a turtle's preference to emerge on a beach, there may be other factors that affect a turtle's tendency to nest after it has emerged. An index that relates the number of nests to the number of false crawls in an area is useful in estimating the post-emergence suitability of a beach for nesting (Figure 4). In the present study this index is termed "nesting success" and is defined as the percentage of total emergences that result in nests (Figure 5).

Historically, the distribution of loggerhead emergences on the island has been consistent with the distribution of nests (ABI, 1987-1994), with no difference in nesting success among areas. However, in recent years zones A through C have experienced lower nesting success due to beach renourishment activities conducted just south of Ft. Pierce Inlet. This temporary drop in nesting success has been reported at other renourished beaches throughout Florida (Steinite et al. 1998; Herren, 1999).

Reconstruction of the primary dune in survey zone "O" was completed by the power plant prior to the beginning of the 2005 sea turtle nesting season. Dune restoration projects, such as this one, were conducted in St. Lucie and Martin counties due to the widespread obliteration of the primary dunes during the 2004 hurricane season. Despite the compact material and

erosion problems associated with the FPL dune, nesting success was not noticeably different from nesting success in unaffected survey zones to the north and south of the project area.

Cool water intrusions frequently occur over the continental shelf of southeast Florida during the summer (Smith, 1982). Typically these cold-water upwelling events last less than a week and have little effect on overall nest numbers for the season. While these natural fluctuations in temperature have been shown to temporarily affect loggerhead nesting patterns on Hutchinson Island, there has been no indication that power plant operation has had any effect on these temporal patterns (ABI, 1988).

1.4.2 Green Sea Turtle Nesting

The green turtle inhabits tropical and subtropical waters of the Atlantic, Pacific, and Indian Oceans. It is second to the loggerhead as the most common sea turtle on Florida nesting beaches. Female green turtles in Florida migrate from foraging areas to their natal beaches every two years (Witherington and Ehrhart, 1989b) and show a high degree of nest site fidelity (Miller, 1997). Mating may occur along the way to the nesting beach (Meylan et al., 1992), far from the nesting beach at distant mating grounds (Limpus, 1993), or near-shore to the nesting beach (Carr and Ogren, 1960). Approximately 99% of the green turtle nesting in Florida occurs on the Atlantic coast from Brevard through Broward Counties. On Hutchinson Island, green turtles have had alternating years of nesting: a high nesting year followed by a low nesting year with little fluctuation, although this pattern has become less distinct in recent years. This bimodal pattern is also seen at other green turtle rookeries throughout their nesting range. Females lay an average of three clutches at 10-17 day intervals (Miller, 1997) and will remain near the nesting beach during the inter-nesting period (Carr et al., 1974).

1.4.3 Leatherback Sea Turtle Nesting

The leatherback turtle is the most widely distributed reptile in the world (Mrosovsky, 1987) where it inhabits waters of the Atlantic, Pacific, and Indian Oceans. Nesting occurs on subtropical and tropical beaches and, after nesting, leatherbacks travel to temperate and sub-arctic waters to forage. Leatherbacks inhabit Florida waters primarily during the nesting

season (March-June) and are generally found in higher densities close to shore, rather than offshore (Schroeder and Thompson, 1987). There they feed and/or rest during inter-nesting intervals (time between subsequent nests, typically nine days). Leatherbacks are not as site specific in their nest site selection as are the hard-shelled turtles (Dutton et al., 1999) and may relocate a hundred kilometers or more (Eckert et al., 1989) to lay additional nests during the season. The number of leatherback nests in Florida has increased more than 10% per year since 1979 (Stewart et al., 2011) but it is unknown whether the increase is from new recruits to the population or if it represents migrants from other Caribbean nesting beaches.

1.4.4 Long-Term Trends in Sea Turtle Nesting

Various methods were used prior to 1981 to estimate the total number of loggerhead nests on Hutchinson Island. All were based on the number of nests found in the nine 1.25 km-long survey areas (ABI, 1980a). Each of these methods was subsequently found to consistently overestimate island totals (ABI, 1987). Since whole-island surveys began in 1981, it has been possible to determine the actual proportion of total nests deposited in the nine areas. This has allowed extrapolation from the nine survey areas to the entire island for years 1981 to 2000. For instance, from 1981 through 1994, the total number of nests in the nine areas ranged from 32.5 to 35.6 percent of the total number of nests on the island. This is slightly higher than the 31.3 percent that would be expected based strictly on the proportion of linear coastline comprised by the nine areas. Using the 13-year mean of 33.81 percent, estimates of the total number of nests on Hutchinson Island can be calculated by multiplying the number of nests in the nine areas by 2.958. This technique, when applied to the nine survey areas during the 13 years in which the entire island was surveyed, produced whole-island estimates within 5.3 percent of the actual number of nests counted. Since the proportion of nests recorded in the nine survey areas remained relatively constant over the last 13 years, this extrapolation procedure provides a useable estimate of total loggerhead nesting for years prior to 1981, and is used to generate data points for 1971 through 1979 in Figure 6. In 2001, these nine 1.25 km sections were abandoned and whole island surveys were conducted in the existing 36 one-kilometer segments.

It is clear that loggerhead nesting activity on Hutchinson Island fluctuates considerably from year to year (Figure 6). Annual variations in nest densities are also common at other rookeries, and probably result from non-annual reproductive behavior. No relationships between annual fluctuations in nesting activity and power plant operation or intake/discharge construction have been found. However, loggerhead nesting on Hutchinson Island mirrors trends in nesting statewide and has shown a decline over the past ten years. In fact, statewide loggerhead nesting has declined by over 16% since 1998, although this recent trend may be stabilizing (Witherington, 2012).

Green and leatherback turtles nest on Hutchinson Island, but in fewer numbers than loggerhead turtles. Prior to 1981, both survey (nine 1.25 km-long sections) and inter-survey areas were monitored for the presence of green and leatherback nests. Thirty-one kilometers of beach from the first 1.25 km segment south to the St. Lucie Inlet were included in that effort. During whole-island surveys from 1981 through 1993, only 2.6 percent (7) of the leatherback nests (n=266) and only 1.4 percent (12) of the green turtle nests (n=831) were recorded on the five kilometers of beach north of the first 1.25 km segment. Therefore, previous counts of green and leatherback nests within the 31 kilometers surveyed probably were not appreciably different from total densities for the entire island. Based on this assumption, green and leatherback nest densities may be compared among all survey years; with the exception of 1980 when less than 15 kilometers of beach were surveyed.

Since surveys began in 1971, the number of nests observed on the island has ranged from five to 565 for green turtles and from one to 507 for leatherbacks (Figures 7 and 8). Temporal nesting patterns for these species differ from the pattern for loggerhead turtles. Green turtles typically nest on Hutchinson Island from mid-June through the first or second week of September. Leatherback turtles usually begin nesting in March or April and continue to nest through early to mid-July. Considerable fluctuations in green turtle nesting on the island have occurred among survey years (Figure 7). This is not unusual since there are drastic year-to-year fluctuations in the numbers of green turtles nesting at other rookeries (Carr et al., 1982). Despite these fluctuations, data collected through 2011 suggest an overall increase in nesting since 1971 and may reflect an increase in the number of nesting females in the Hutchinson Island area. This increase in green turtle nesting is similar to increases seen statewide.

Previous surveys have shown that green turtles typically nest in greater numbers along the southern half of the island. One exception was the 2005 nesting season where there were a greater number of nests found along the northern half of Hutchinson Island.

Leatherback nest numbers have continued to increase on Hutchinson Island and mirror statewide nesting increases seen over the last 11 years. This increase in leatherback nesting has not only been reported for Hutchinson Island, but for nesting beaches to the north and south. These combined increases in nest activity likely reflect an overall increase in the number of nesting females on the Atlantic coast of Florida.

1.4.5 Predation on Sea Turtle Nests

Since nest surveys began in 1971, raccoon predation has been the leading cause of turtle nest destruction on Hutchinson Island. Researchers at other locations have reported raccoon predation levels as high as 70 to nearly 100 percent (Hopkins et al., 1979). Raccoon predation of loggerhead turtle nests on Hutchinson Island has not approached this level during any study year, though levels for individual 1.25 km-long areas have been as high as 80 percent. Overall predation rates for survey years 1971 through 1977 were between 21 and 44 percent, with a high of 44 percent recorded in 1973. A pronounced decrease in raccoon predation occurred after 1977, and overall predation rates for the nine areas have not exceeded 10 percent since 1979. A decline in predation rates on Hutchinson Island may be attributable to trapping programs, construction activities, habitat loss, and disease.

Ghost crabs have been reported by numerous researchers as important predators of sea turtle nests (Hopkins et al, 1979; Stancyk, 1982) and are currently the most significant predators on Hutchinson Island. Though turtle nests on Hutchinson Island have probably been depredated by ghost crabs since nesting surveys began in 1971, quantification of ghost crab predation did not begin until 1983.

Occasionally, sea turtles nests are depredated by other animals such as bobcats, birds, and fire ants. However, this only accounts for a small portion of the total number of predation events on Hutchinson Island.

1.5 INTAKE CANAL MONITORING SUMMARY

Entrainment of sea turtles at the St. Lucie Plant has been attributed to the presumed physical attractiveness of the offshore structures housing the intake pipes rather than to plant operating characteristics (ABI, 1980b and 1986). The velocity caps, which are supported above the openings to each intake pipe, eliminate vertical water entrainment and substantially reduce current velocities near the structures by spreading horizontal draw over a wider area. Even when both units are operating at full capacity, turtles must actively swim into the mouth of one of the structures before they encounter current velocities sufficient enough to entrain them. Consequently, a turtle's entrapment relates primarily to the probability that it will detect and subsequently enter one of the intake structures.

Removal of turtles from the intake canal has been an integral part of the St. Lucie Plant environmental monitoring program. Turtles entering the ocean intake structures are entrained with cooling water and rapidly transported through the intake pipes into an enclosed canal system where they must be manually captured and returned to the ocean. Since the plant became operational in 1976, turtles entrapped in the intake canal have been systematically captured, measured, weighed, tagged, and released. In July of 1994, responsibility for sea turtle research and conservation activities was transferred from Applied Biology, Inc. to Quantum Resources, Inc. Since 2005, the sea turtle biologists working at the power plant were contracted out by three separate companies, none of which were Quantum Resources. Despite the non-cohesive suite of employers, the group worked under one marine turtle permit and methodologies employed in the canal capture program have remained essentially unchanged. Therefore, data collected from 1994 through the present are directly comparable to previous years' data. In August of 2009, responsibility for sea turtle research and conservation activities was transferred to Inwater Research Group, Inc.

Historically, most turtles entrapped in the St. Lucie Plant intake canal were removed by means of large-mesh tangle nets fished near the intake canal headwalls at the extreme eastern end of the intake canal (Figure 2). Nets used were from 30 to 40 m in length, 3 to 4 m deep and composed of 40 cm stretch mesh multifilament nylon. Large floats were attached to the surface, and un-weighted lines were used along the bottom. Turtles entangled in the nets

generally remained at the water's surface until removed. Since its inception in 1976, the canal capture program has been under continual review and refinement in an attempt to minimize both entanglement time and injuries/mortalities to entangled sea turtles. Prior to April 1990, turtle nets were usually deployed on Monday morning and retrieved on Friday afternoon. During periods of deployment, the nets were inspected for captures at least twice each day (mornings and afternoons). Additionally, St. Lucie Plant personnel checked the nets periodically, and biologists were notified immediately if a capture was observed. Sea turtle specialists were on call 24 hours a day to retrieve captured turtles from the plant intake canal system.

Beginning in April 1990, after consultation with NMFS, net deployment was scaled back to daylight hours only. Concurrently, surveillance of the intake canal was increased and biologists remained on site for the duration of each day's netting activities. This measure decreased response time for removal of entangled turtles from nets and provided an opportunity to improve daily assessments of turtle levels within the canal.

During each day's directed capture efforts, formal inspections of the intake canal were made to determine the numbers, locations and species of turtles present. Surface observations were augmented with periodic underwater inspections, particularly in and around the barrier nets. These observations allowed for a rough estimate of how many sea turtles were in each section of the canal on a given day. Records of daily canal observations were compared with capture data to assess capture efficiencies.

Capture activities at the intake canal included a variety of methods; large tangle nets and dip nets were used daily and hand capture methods were employed when water clarity was acceptable. Better utilization of currents and eddies, adjustments to tethering lines, multi-net deployments and increased efforts to hand capture turtles have contributed to reduced entrapment times in recent years.

Regardless of capture method, all turtles removed from the canal were identified to species, measured, weighed, tagged and examined for overall condition (wounds, abnormalities, parasites, etc.). Beginning in July 1994, all captured turtles were photographed dorsally and

ventrally prior to release, and the photographs were retained for future reference. Additionally, as of July 2001, Passive Integrated Transponder tags (PIT tags) were injected subcutaneously into the right front flipper of all turtles as outlined in the Biological Opinion (issued by NMFS in May 2001). Healthy turtles were released into the ocean the same day of capture. Sick or injured turtles were treated and occasionally held for observation prior to release. When treatment was warranted, turtles were transported to an approved rehabilitation facility after consultation with the Florida Fish and Wildlife Conservation Commission (FFWCC). As of 1982, necropsies were conducted on all dead turtles found in fresh condition. Currently, all fresh dead turtles are held on ice and taken to a qualified veterinarian for necropsy.

Beginning in July 2004, blood was drawn from all turtles captured at the canal as part of a collaborative effort with the University of Florida, the Marinelife Center of Juno Beach, and the Clearwater Aquarium. This was part of a study to catalog biochemical blood parameters for wild captured sea turtles. The samples collected at the power plant represent the largest database of sea turtle blood profiles ever compiled. This project was completed in 2008, and the blood profiles were posted on a website designed for this project by the University of Florida to aid researchers, veterinarians and rehabilitation facilities.

In addition, a past collaborative effort with the University of Georgia required biopsy samples to be taken from green turtles captured at the power plant as part of a study on green turtle genetics.

In 2010, Inwater Research Group biologists at the St. Lucie power plant collaborated with researchers from Wright University looking at the genetic bar-coding of marine leeches from Florida sea turtles and their divergence in host specificity. During this report period, 31 samples were taken from loggerhead and green turtles and sent to Audrey Mcgowin at Wright University for analysis. This collaboration led to a publication in the Molecular Ecology Resources Journal. Collaborations with other researchers in 2011 are discussed in section 3.4.

1.5.1 Loggerhead Turtle Captures

Historically, loggerheads have been the most abundant species in the canal. Since 1977, the first full year of plant operation, the number of loggerheads captured each year ranged from 62 in 1981 to 623 in 2004. Loggerhead capture rates have exhibited considerable year-to-year fluctuation, but overall have shown a persistent increase since the late 1980s (Figure 10, Table 1). The decrease in loggerhead captures in 2007 was likely the result of an extended fueling outage at the power plant and not an indication of true decline in relative abundance. During outages, when one unit is taken off line, water flow through the intake canal system is half the normal volume, which in turn affects the number of turtles entrained into the canal system. The size frequency of loggerheads captured at the intake canal of the power plant ranges from predominately juvenile to sub-adult animals, with mature adult animals captured mainly during the nesting season of April – September (Figure 11, Table 2).

1.5.2 Green Turtle Captures

The number of green turtles captured each year since 1977 has ranged from three in 1979 to a record high of 673 in 1995 (Figure 10, Table 1). The increasing number of captures over recent years suggests that there has been an increase in the number of turtles inhabiting the shallow coastal reefs adjacent to the power plant's offshore intake structures. There was a spike in green turtle captures during the mid-1990's that leveled off to a capture rate consistently greater than numbers recorded prior to 1994. This increase has been mainly driven by small juvenile animals captured at the intake canal. Size frequencies of green turtles at the intake canal are dominated by juvenile animals with few sub-adult animals captured (Figure 12). Adult green turtles are captured in relatively small numbers during the nesting season of May-October (Table 3).

Green turtle capture rates at the St. Lucie Power Plant vary from year to year and, like loggerhead captures, can be affected by power plant outages. For example, 2007 had the lowest numbers of green turtles captured since 1992, coinciding with extended outages that lasted five months out of the year.

1.5.3 Leatherback, Hawksbill, Kemp's ridley Turtle Captures

Captures of leatherback, hawksbill, and Kemp's ridley turtles have been infrequent and scattered throughout the years (Table 1). However, each species has shown rather pronounced seasonal occurrences. Over 60 percent of all leatherbacks were captured in March and April and over 60 percent of hawksbills were captured between July and September. This pattern of seasonal captures is even more pronounced with the Kemp's ridley sea turtle. Nearly 90 percent of all Kemp's ridleys were caught between the months of December and April.

1.5.4 Relative Condition

Turtles captured alive in the intake canal of the St. Lucie Plant are assigned a relative condition based on weight, activity, parasite infestation, barnacle coverage, injuries and any other abnormalities which might affect overall vitality. Relative condition ratings can be influenced by a number of factors, some related and others unrelated to entrainment and/or entrapment in the intake canal. A rating of good indicates that turtles have not been negatively impacted by their entrapment in the canal, at least as evidenced by physical appearance. Although ratings of fair or poor imply reduced vitality, the extent to which entrainment and entrapment are responsible is often indeterminable. In some instances, conditions responsible for lower ratings, such as boat collision, fisheries gear entanglement or disease were obviously sustained prior to entrainment. However, in recent years turtles have been found with fresh scrapes and cuts incurred during entrainment. Some of these incidents have had a negative effect on a sea turtle's overall condition and been categorized as directly causal to power plant operation. Causal determinations are made by consultation with personnel from Florida Fish and Wildlife Conservation Commission (FFWCC) and/or a qualified veterinarian.

1.5.5 Mortalities and Injuries

Sea turtle mortalities have been closely monitored throughout the life of the capture program in an attempt to assign probable cause and take appropriate remedial action to minimize future

occurrences. Previous analyses of canal capture data identified drowning in nets (A1A barrier net, UIDS barrier, and tangle nets), drowning in the intake pipes during periods of reduced intake flow, injuries sustained from dredging operations, and injuries sustained from the mechanical rakes used in the intake wells as probable mortality factors (ABI, 1987) (FPL, 1995). Since that analysis, design changes have addressed each of these problem areas and have reduced mortalities significantly.

Over the entire monitoring program's history (1976-2011), 154 (1.8%) of the 8379 loggerheads and 94 (1.5%) of the 6177 green turtles entrained in the canal were found dead. Mortalities spanned the range of size classes for loggerheads (SSCL = 47.4-101.3 cm), while green turtle mortalities primarily involved juveniles less than 48 cm in length. However, one adult green turtle (a male) was injured upon entrainment in 2005 and later expired in a rehabilitation facility. The four Kemp's ridley mortalities documented at the St. Lucie Plant during 1987 and 1988 were the only deaths for this species. No dead leatherback or hawksbill turtles have ever been recorded.

Modifications to capture procedures, improvements to barrier nets and virtual elimination of low flow conditions within the intake pipes have resulted in a substantial reduction in sea turtle mortalities over the life of the canal capture program. Mortality rate, expressed as the percentage of total captures involving dead animals, declined from 7.8 percent during the period 1976-1984 to 1.2% for the period 1985 to present (Table 1).

Injuries and mortalities are categorized in two ways—causal to power plant operation or non-causal to power plant operation. These decisions are made by consultation with FFWCC and/or a qualified veterinarian. Not all mortalities and injuries are causal to power plant operation, as some sea turtles enter the canal in either a moribund state or have had pre-existing conditions related to fisheries, boat interactions or disease. Injuries causal to power plant operation are recorded and go against the take limit established by the most recent Biological Opinion set forth by NMFS.

1.6 SEA TURTLE PROTECTION ACTIVITIES SUMMARY

1.6.1 NMFS Section 7 Consultations

In accordance with Section 7 of the Endangered Species Act (ESA), FPL must submit a Biological Assessment by the Nuclear Regulatory Commission (NRC) to the National Marine Fisheries Service (NMFS) for review as part of the formal consultation process if FPL exceeds their incidental take limit established by the most recent Biological Opinion (BO) set forth by NMFS. The BO is an analytical document that looks at the effects of a federal action on endangered and threatened species.

Section 7(b)(4) of the Endangered Species Act (ESA) refers to the incidental take of listed species. It sets forth the requirements when a proposed agency action is found to be consistent with section 7(a)(2) of the ESA, and the proposed action may incidentally take listed species. NMFS is responsible for issuing a statement that specifies the impact of any incidental take of endangered or threatened species. It also states that reasonable and prudent measures, and terms and conditions to implement the measures, be provided to minimize such impacts.

In 1999, FPL exceeded their anticipated incidental take limit established by the 1997 Biological Opinion (BO) set forth by NMFS. This required reinitiating of consultation under Section 7 of the Endangered Species Act. As part of this consultation, FPL, through Ecological Associates Inc., submitted a report entitled "Physical and Ecological Factors Influencing Sea Turtle Entrainment Levels at the St. Lucie Nuclear Power Plant: 1976-1998." NMFS received the report in March of 2000 and considered this new information when developing the new opinion. On May 4, 2001, NMFS issued its BO as part of the reinitiating of consultation subsequent to the 1997 BO.

In the new BO there were a number of changes, most importantly in the Incidental Take Statement. This, in summary, states that FPL will exceed their take limits for a calendar year if any of the following occur: more than 1000 sea turtles are captured, more than 1% of the

total number of loggerhead and green turtles (combined) are injured/killed causal to plant operation, more than two Kemp's ridley sea turtles are injured/killed causal to plant operation, or if any hawksbill or leatherback sea turtles are injured/killed causal to plant operation. In the case where 1% of the combined loggerhead and green turtle captures is not a whole number, it is rounded up (e.g. 520 combined captures = take limit of 6). If any of these events occur, reinitiating of a Section 7 consultation will be required.

Based on the latest BO issued by NMFS, FPL did not exceed its take limit at the St. Lucie power plant during 2011. However, in 2006 FPL did exceed their sea turtle take limit and a new Section 7 consultation was required. This consultation is currently ongoing between NMFS and the NRC. A new Biological Opinion is expected in 2012.

1.6.2 Barrier Net Maintenance

In 1978, a barrier net at the A1A bridge was constructed to confine turtles to the easternmost section of the intake canal, where capture techniques have been most effective. This net is constructed of large diameter polypropylene rope and has a mesh size of 20.3 cm x 20.3 cm. A cable and series of large floats are used to keep the top of the net above the water's surface and the bottom of the net is anchored by a series of concrete blocks. The net is inclined at a slope of 1:1, with the bottom positioned upstream of the surface cable. This reduces bowing in the center and minimizes the risk of a weak or injured turtle being pinned underwater by strong currents.

In the past, the integrity of the barrier net was occasionally compromised, and turtles were able to move west of A1A. These turtles were further constrained downstream by an underwater intrusion detection system (UIDS) consisting, in part, of a large barrier positioned perpendicular to the north-south arm of the canal (Figure 2). The UIDS security barrier has a mesh size of 22.9 cm x 22.9 cm. Prior to completion of the UIDS in December 1986, turtles unconfined by the A1A barrier net were usually removed from the canal at the intake wells of Units 1 and 2 (Figure 2). They were then retrieved by means of large mechanical rakes or specially designed nets. Following construction of the UIDS barrier, only the smallest individuals were able to reach the intake wells. Improvements made to the A1A barrier net

during 1990 had effectively confined all turtles larger than 32.5 cm carapace length (28.7 cm carapace width) to the eastern end of the canal.

In response to the large numbers of small green turtles entrained in the intake canal in the 1990s, an improved design involving a small 5" mesh barrier net was erected 150 m east of the A1A net in January 1996. This barrier net was designed to confine all turtles with a carapace width greater than 18 cm to the extreme eastern portion of the intake canal. However, the integrity of this net was often compromised by incursions of seaweed, drift algae, jellyfish, and siltation. During these events, water velocities around the net increased dramatically creating an insufficient net slope that caused several sea turtle mortalities. To address this design problem and to further alleviate mortalities, FPL constructed a new net with a stronger mesh and added support structures. Dredging of the canal east of the A1A net was also conducted to minimize water velocities around the new barrier net. Construction was completed in November 2002. These improvements have enabled the new net to withstand events that caused design failure of the old barrier net, thus reducing the potential for sea turtle mortalities.

Maintaining the integrity of the primary 5" barrier net and the larger mesh A1A net is crucial to the continued reduction in residency times and mortality rates in the St. Lucie Power Plant intake canal. Quarterly inspections of these nets are conducted by FPL and cleaning the nets of debris is performed when warranted. In addition to scheduled inspections and cleaning of the nets, divers are deployed when the integrity of the nets are threatened by algae events. These algae events can cause undue stress to the net structure and cause the net to fail. Net failures increase both the risk of sea turtle mortalities and residency times. Turtles can become tangled in or pinned under a failed barrier net, leading to a causal drowning mortality. Furthermore, if turtles have access to larger portions of the intake canal, then it becomes more challenging to quickly entrap and release these animals back into their natural environment.

Daily inspections are performed from a small boat to remove floating debris and to repair holes at or near the water surface. The formal quarterly dive inspection includes hole repair, debris removal, and airlift dredging of accumulated silt if necessary. Maintaining the integrity of the primary barrier net is essential to reducing mortality rates and residency times of

entrained sea turtles and is mandated by the most recent Biological Opinion issued by the National Marine Fisheries Service. The Biological Opinion states "FP&L shall maintain a 5 inch barrier net across the intake canal, east of the existing 8 inch mesh barrier net." The new primary barrier net, with few exceptions, has performed as designed and effectively confined sea turtles to the eastern 200 meters of canal.

1.6.3 Intake Pipe Cleaning and Maintenance

Since 2002, there has been a steady increase in the number of sea turtles incurring scrapes during transit through the power plant intake pipes. The scrapes vary in degree of severity, with most being minor and similar to those found on sea turtles that inhabit near-shore reefs. However, some of these scrapes are moderate to severe, causing some turtles to be sent to rehabilitation facilities for treatment. This prompted FPL to inspect the intake pipes in 2006 and schedule cleaning of bio-fouling and marine debris that were thought to be causing the scrapes to entrained sea turtles. This project is ongoing and results to date are provided in Section 3.3 of this report.

1.6.4 Sea Turtle Stranding and Salvage Network, Turtle Walks and Collaborative Efforts

An amendment to the Environmental Protection Plan, Requirement 4.2.1 of the St. Lucie Unit 2 operating license Appendix B, was approved in 1999. This mandated that the participation in the Sea Turtle Stranding and Salvage Network (STSSN) and Public Service Turtle Walks was to become part of the Biological Opinion and Incidental Take Statement issued by the National Marine Fisheries Service.

As participants in the Sea Turtle Stranding and Salvage Network, FPL's sea turtle biologists routinely respond to sea turtle strandings in St. Lucie and Martin Counties. This activity involves the collection of information on turtles that are found dead, debilitated, or that have been impacted by human-related activities. The efforts of the Florida STSSN are critical to the Florida Fish and Wildlife Conservation Commission's (FFWCC) conservation and recovery programs. All permit holders participating in this program are required to complete

a STSSN stranding report for each dead or debilitated turtle encountered. Completed stranding reports were sent to FFWCC. Results from stranding events in 2011 are presented in section 3.4 of this report.

Florida Power & Light Company conducts public service turtle walk programs during the summer sea turtle nesting season. These turtle walks educate the public about relevant sea turtle protection issues and, in most cases; they are able to view a nesting loggerhead sea turtle. This public service activity is mandated by the most recent Biological Opinion issued by NMFS and results from the 2011 season are presented in section 3.4 of this report.

Florida Power & Light's contracted sea turtle biologists continue to assist other sea turtle researchers, universities, nonprofit organizations, and state and federal agencies by providing data, specimens, and public outreach. They have worked with the following organizations over the course of the programs existence: Florida Fish and Wildlife Conservation Commission, National Marine Fisheries Service, US Fish and Wildlife Service, Marine Turtle Specialist Group, US Army Corps of Engineers, Smithsonian Institution, South Carolina Wildlife and Marine Resources Division, Center for Sea Turtle Research (University of Florida), Florida Atlantic University, University of Central Florida, Texas A & M University, University of Rhode Island, University of South Carolina, University of Illinois, University of Georgia, Virginia Institute of Marine Science, Duke University Marine Lab, Western Atlantic Turtle Symposium, South Atlantic Fishery Management Council, Florida Marine Fisheries Commission, Harbor Branch Oceanographic Institution, Environmental Studies Center, Florida Oceanographic Society, and the National Research Council. Projects and collaborative efforts conducted in 2011 are presented in Section 3.4 of this report.

PART II

1.0 NESTING SURVEY (2011 RESULTS)

In 2011, areas D-S were surveyed by Inwater Research Group, Inc. (Figure 3). Ecological Associates, Inc. surveyed areas A-C as part of a beach renourishment project south of the Fort

Pierce inlet. Data from those areas as well as the south end of Hutchinson Island were supplied by Ecological Associates, Inc. and were used to provide whole-island nesting totals.

From February 28th through March 27th, 2011, several preliminary nest surveys were conducted along Hutchinson Island in areas D-S. Five sea turtle nests (leatherback) were recorded in zones D-S prior to the beginning of formal nesting surveys on March 29th, 2011. From March 29th through September 30th, 2011, nest surveys were conducted on a daily basis. Biologists used all-terrain vehicles to survey the island each morning. New nests, non-nesting emergences (false crawls), and nests destroyed by predators were recorded for each of the 1-km-long survey areas (Figure 3).

Data collected from beach nesting surveys were reported to the Florida Fish and Wildlife Conservation Commission (FFWCC) as part of the Index Nesting Beach Survey and the Statewide Nesting Beach Survey. In a cooperative effort, data from stranded turtles found during beach surveys were routinely provided to the FFWCC and the National Marine Fisheries Service (NMFS) through the Sea Turtle Stranding and Salvage Network.

1.1 Loggerhead Turtle Nesting

In 2011, 6,705 loggerhead nests were recorded on South Hutchison Island (Figure 6) which is the highest number since 2001. IRG biologists observed 3,227 loggerhead nests in the one-kilometer sections A-S, on the north end of the island. The first recorded nest was on April 20th and the last loggerhead nest was recorded on September 6th. There were 3,822 loggerhead false crawls observed in the FPL monitored area.

Fifty-four of the 3,227 loggerhead nests were marked and evaluated to assess nest productivity. The 54 nests contained a cumulative total of 5,345 eggs. Of these, 3,063 successfully hatched and emerged from the marked nests. This represents an emergence success rate of 57.31%. There were 80 live loggerhead turtles found in the nests, which were released and not accounted for in the hatch success rate.

1.2 Green Turtle Nesting

In 2011, 451 green turtle nests were recorded on Hutchison Island (Figure 7) which is a decrease from the record high in 2010 (565). Green turtles often show a bimodal nesting pattern, which means a year of high nesting numbers followed by a year with low numbers. However, green turtles occasionally have two consecutive low nesting years followed by a high nesting year. This occurred in 2003 through 2005, where 2003 and 2004 were low years and 2005 was the high year. IRG biologists observed a total of 208 green turtle nests in the one-kilometer sections A-S on the North end of the island. The first recorded nest was on May 26th and the last green turtle nest was recorded on September 23rd. There were 325 green turtle false crawls observed in the surveyed areas A-S.

Eighteen of the 208 green turtle nests were marked and evaluated to assess nest productivity. The 18 nests contained a cumulative total of 2,146 eggs. Of these, 1171 successfully hatched and emerged from the marked nests. This represents an emergence success rate of 54.57%. There were 10 live green turtles found in the nests, which were released and not accounted for in the hatch success rate.

1.3 Leatherback Turtle Nesting

In 2011, 507 leatherback turtle nests were recorded on Hutchison Island (Figure 8). This number marks the highest nest total recorded since whole island surveys began. Leatherback turtles often exhibit a bimodal nesting pattern similar to green turtles and recently, their overall nesting numbers have increased nesting during both high and low years. Because of these increases, leatherback nesting is expected to increase in subsequent years. IRG biologists observed a total of 131 leatherback sea turtle nests in the one-kilometer sections A-S on the north end of the island. The first recorded nest was on March 21st and the last leatherback sea turtle nest was recorded on July 10th. There were 30 leatherback sea turtle false crawls observed in the surveyed areas A-S.

Seventeen of the 131 leatherback turtle nests were marked and evaluated to assess nest productivity. The 17 nests contained a cumulative total of 1491 eggs. Of these, 396

successfully hatched and emerged from the marked nests. This represents an emergence success rate of 26.56%. There were 10 live leatherback turtles found in the nests, which were released and not accounted for in the hatch success rate.

1.4 Predation

IRG biologists recorded a total of 290 predation events for Hutchinson Island in 2011 (within beach sections A-S, Figure 9). Sea turtle nests on Hutchinson Island were depredated by ghost crabs, raccoons, birds, fire ants, and bobcats. Ghost crabs accounted for the majority of individual predation events with a total of 98 occurrences. The second most abundant predator was the raccoon with 32 events. One hundred and forty predation events consisted of both raccoon and ghost crab predation.

Nest excavation provides an opportunity to more accurately account for predation activity. For example, fire ant and ghost crab predation is not always evident from a cursory inspection of the sea turtle nest's surface. Predators negatively affected 48 of the 89 nests evaluated for hatch success. Therefore, the percentage of sampled nests impacted by predators was 53.9%.

2.0 INTAKE CANAL MONITORING (2011 RESULTS)

Since plant operation began in 1976, 14,702 sea turtles (including recaptures) representing five different species have been removed from the intake canal. These include 8,379 loggerhead (including 634 recaptures), 6177 green (including 2048 recaptures), 35 leatherback, 54 Kemp's ridley and 57 Hawksbill turtles (Table 1).

During 2011, 521 sea turtles were removed from the intake canal, including 302 loggerheads, 217 green turtles, and 2 hawksbills (Table 1, Figure 10). The majority of these turtles (96.74%) were captured alive and released back to the ocean. Eight (1.54%) were taken to rehabilitation facilities for treatment of injuries or disease and nine turtles (1.73%) were found dead. None of the eight turtles taken to rehab facilities had injuries causal to power plant operation. Only one of the nine turtles found dead was causal to power plant operations. Mortalities and injuries are discussed in detail in Section 2.5.

In 2011, methods to remove sea turtles from the intake canal included the use of tangle nets, dip nets, and hand capture by free diving. Long handled dip nets employed from small boats, the canal banks, and headwall structures were moderately effective in capturing turtles with carapace lengths of about 40 cm or less. Six (1.99%) of the loggerhead sea turtles removed from the intake canal in 2011 were caught with dip nets. Before 2009, only green turtles were captured in this manner. Divers were employed to hand capture turtles whenever underwater visibility permitted. This technique has proven highly effective in the capture of turtles of all sizes, particularly less active individuals often found partially buried in the sediment near the 5-inch barrier net. Hand capture efforts have had a significant impact in reducing residency times for turtles in the intake canal.

During 2011, 99.8% (520) of all turtles entrapped in the canal were captured east of the primary barrier net - 230 by tangle nets, 10 off the 5" barrier net, 36 by dip net, and 244 by hand capture. Proactive captures (hand capture and dip net) accounted for over half of the turtles removed from the intake canal in 2011. No turtles captured in 2011 were removed from the intake wells, and only one turtle was captured west of the 5-inch barrier net.

Since the St. Lucie Plant capture program began, most turtles removed from the intake canal have been tagged and released into the ocean at various locations along Hutchinson Island. Consequently, individual turtles can be identified as long as they retain their tags. Over the history of the program at the St. Lucie Plant, 2682 recapture events (634 loggerheads and 2048 green turtles) have occurred. The recapture rate for loggerhead turtles in 2011 was 6.95%. The recapture rate for green turtles in 2011 was 34.56%. Occasionally, turtles are captured that have been tagged by other researchers. There were eight such captures in 2011 that included five loggerheads and three green turtles. Four identified tags were from sea turtles that were originally captured and tagged in Florida. Four turtles had "strange" tags for which we could not identify the tagging agency or source.

2.1 Loggerhead Turtle Captures

Over the past 36 years, loggerhead captures have exhibited considerable year-to-year fluctuations. However, figures since 1976 indicate a slight increase in loggerhead capture rates at the intake canal (Figure 10, Table 1). The number of loggerheads removed from the intake canal in 2011 was the highest since 2008.

During 2011, monthly captures of loggerheads ranged from 10 in December to 71 in July, with a monthly mean of 25.2 (Table 2). Over the entire history of the capture program, monthly catches have ranged from 0 to 133, with the greatest number of captures occurring during March 2004.

Of the 302 loggerheads captured in 2011 for which straight standard carapace lengths (SSCL) are available, one was a hatchling washback (SSCL = 5 cm), 168 were juveniles (SSCL $\leq$ 70 cm), 58 were adults (SSCL $\geq$ 85 cm) and 75 were transitional (SSCL 70-85 cm; Hirth, 1980, Figure 11). The latter group probably includes both mature and immature individuals. Of the 31 turtles classified as adults for whom sex was recorded, 54 were females and 4 were males, with females predominating by a ratio greater than 13:1. One additional transitional-phase loggerhead was recorded as a male even though its SSCL was 83.5 cm because sex was apparent from the animal's tail length.

2.2 Green Turtle Captures

Over the past 36 years, green turtle captures have exhibited considerable year-to-year fluctuations. The number of green turtles captured each year since 1977 has ranged from three in 1979 to a record high of 673 in 1995 (Figure 10, Table 1). The increase in number of captures over recent years suggests that there has been an increase in the number of turtles inhabiting the shallow coastal reefs adjacent to the power plant's offshore intake structures. Two of those years (2007 and 2009) had the lowest annual total since 1997 due to extended power plant outages that lasted for longer than a 2-month period. In 2009, there were three power plant outages that lasted for a total of 84 days.

During 2011, monthly green turtle captures ranged from 1 in April to 54 in November with a monthly mean of 18.1 (Table 3). The March 1996 capture total of 147 green turtles is the largest for any species, for any month on record. Historically, seasonal capture patterns of green turtles have been more pronounced than for loggerheads, with more than a third of all green captures occurring between January and March (Table 3).

Of the 217 green turtles captured in 2011, there were 209 juveniles or sub-adults (SSCL < 83cm) and eight adults (SSCL $\geq$ 83 cm; Witherington and Ehrhart, 1989, Figure 12). Of the eight turtles classified as adults, five were females and three were males.

2.3 Leatherback; Hawksbill; Kemp's ridley Turtle Captures

In 2011, there were no leatherback or Kemp's ridley turtles entrained, but two hawksbill turtles were captured in the intake canal of the St. Lucie Plant. One was a sexually immature individual (SSCL = 52.9 cm). The second turtle was most likely a sexually immature hawksbill-loggerhead hybrid with a SSCL of 72.8 cm. This animal had a smaller head, imbricated scutes, and carapace coloration similar to a hawksbill, with other external features which resembled a loggerhead. A biopsy was taken for genetic analysis and the results are pending.

2.4 Relative Condition

Turtles captured alive in the intake canal of the St. Lucie Plant were assigned a relative condition based on weight, activity, parasite infestation, barnacle coverage, injuries and any other abnormalities which might affect overall vitality. During 2011, 95.4% (288) of all loggerheads found in the canal were alive and in good condition. Only 6.6% (20) of all loggerheads were individuals in fair or poor condition and 0.3% (1) was found dead. Of the 217 green turtles removed from the intake canal in 2011, 92.2% (200) were in good condition, 4.1% (9) were in fair or poor condition and 3.7% (8) were found dead. Conditions for all other sea turtles captured at the intake canal in 2011 were categorized as good.

Of the 521 turtles removed from the intake canal during 2011, 477 (91.6%) were observed with fresh cuts and scrapes that may have been incurred during transit through the intake pipes. The scrapes varied in degree of severity, although most of the scrapes were classified as minor (88.3%). However, some of the scrapes were moderate to severe (11.7%). No scrapes were severe enough to warrant a turtle being sent to a rehabilitation facility.

Of the 521 live turtle removals during 2011, 504 were released into the ocean. Six loggerheads and two green turtles in obvious ill health or suffering serious injuries were transported to either the Marinelife Center of Juno Beach or the Clearwater Marine Aquarium for treatment and rehabilitation. All sick or injured turtles were sent to rehabilitation facilities after consultation with personnel from FWCC.

2.5 Mortalities and Injuries

In 2011, nine mortalities were recorded at the St. Lucie power plant intake canal: one loggerhead and eight green turtles. Only two green turtle mortalities were considered causal to power plant operations.

During the month of January, there were two non-causal mortalities that were reported in the intake canal - one on January 1st and the second on January 14th. Both events consisted of juvenile green turtles which were found moderately decomposed on the 5" mesh barrier net. The turtles were most likely entrained post-mortem and these events were considered non-causal to power plant operation.

During the month of February, there were three non-causal mortalities that were reported in the intake canal. Two juvenile green turtles were found on the 5" mesh barrier net on February 15th, one of which was severely decomposed, while the other was only moderately decomposed. On February 26th, a moderately decomposed juvenile green turtle was found floating in the canal. All three turtles were most likely entrained post-mortem and these events were considered to be non-causal to plant operation.

During the month of August, there was a causal and a non-causal mortality that were reported in the intake canal. On August 1st, a fresh dead juvenile green turtle was found on the 5" barrier net. After a necropsy was performed by Dr. Nancy Mettee at the Loggerhead Marinelife Center of Juno Beach, the mortality event was initially determined to be non-causal to plant operation. However since a clear cause of death was not determined and the final necropsy report did not identify a specific mortality determination, FPL has conservatively classified this mortality as causal to plant operations. The NRC was notified on August 11, 2011 by FPL letter L-2011-321. On August 20th, the skeletal remains of a sub-adult loggerhead were found on the bottom of the canal during visual inspections. The remains were most likely entrained post-mortem and the event was considered to be non-causal to plant operation.

There was one non-causal mortality event during the month of October. On October 23rd, a moderately decomposed juvenile green turtle was found floating at the surface of the intake canal. This turtle had a heavy fibropapilloma load, and the mortality was deemed to be non-causal to plant operation.

Injuries causal to power plant operation are recorded and go against the take limit established in the Biological Opinion set forth by NMFS. In 2011, there was one injury causal to power plant operations.

On December 3rd, a juvenile green turtle was found floating at the surface of the 5" barrier net. After a necropsy was performed by Dr. Mettee, the histopathology report showed that the cause of death was forced submergence which was considered causal to plant operations.

3.0 SEA TURTLE PROTECTIVE ACTIVITIES (2011)

3.1 NMFS Section 7 Consultations

On May 4, 2001, NMFS issued its BO as part of the reinitiating of consultation subsequent to the 1997 BO. In the new BO there were a number of changes, most importantly in the Incidental Take Statement. This, in summary, states that FPL will exceed their take limits for

a calendar year if: more than 1000 sea turtles are captured, or more than 1% of the total number of loggerhead and green turtles (combined) are injured/killed causal to plant operation, or more than two Kemp's ridley sea turtles are injured/killed causal to plant operation, or if any hawksbill or leatherback sea turtles are injured/killed causal to plant operation. In a case where 1% of the combined loggerhead and green turtle captures is not a whole number it is rounded up (e.g. 520 combined captures = take limit of 6). If any of these events occur, re-initiation of a Section 7 consultation will be required.

During 2011, there were two sea turtle mortalities that were causal to power plant operations. No leatherback, hawksbill or Kemp's ridley turtles were injured or killed. A total of 521 turtles were captured in the FPL intake canal for the year. Based on the latest BO issued by NMFS, FPL did not exceed its take limit during 2011. However, FPL did exceed their sea turtle take limit at the St. Lucie power plant in 2006 and reinitiating a Section 7 consultation was required. This consultation is currently ongoing between NMFS and the NRC. A new Biological Opinion is expected in 2012. FPL has identified the contributing factors that led to exceeding the take limit in 2006. The company has responded by cleaning the intake pipes and developing a plan to install turtle excluder grating at the offshore intake structures.

3.2 Barrier Net Maintenance

In 2009, the primary 5" barrier net failed due to an algae event. On October 22nd, hardware broke loose from the north concrete piling, submerging the north half of the net 2-5 ft underwater. An FPL contractor, Underwater Engineering Services, Inc. (UESI), inspected the net the same day to assess the cause of the failure and look for turtles that may have been caught under the net. IRG biologists increased turtle surveillance and capture efforts to include areas west of the primary net. On October 25th, UESI installed large float buoys onto the primary net creating an effective temporary barrier. A thorough inspection of the primary net was promptly completed by Florida Power & Light Company and UESI, which included the concrete pilings, hardware, and cables. A permanent fix to the primary net is scheduled in 2012.

During 2011, there were multiple net failures. On March 21st, the north end of the A1A net became partially submerged. The top of this net was approximately 6" underwater for a span of about 20 ft. Support hardware attaching the floats to the net failed under the combined stress of unusually high tides and higher than usual water levels resulting from a power plant outage. UESI divers repaired the hardware and added additional floats to restore the integrity of the net.

Starting on June 26th, 2011, a heavy inundation of jellyfish and algae threatened the integrity of the 5" barrier net. Underwater Engineering Services (UESI) divers were deployed to remove excess jellyfish and algae from the net, and remained until June 30th when the threat subsided.

On August 20th, 2011, a severe inundation of moon jellyfish caused the 5" barrier net to fail for three consecutive days, August 20th-August 22nd. IRG biologists increased turtle surveillance of the canal during this period when the barrier net failed, and no turtles were seen west of the 5" net. UESI divers were dispatched on August 20th to clean and restore integrity to the net, and remained at the intake canal until the first week of September.

A second severe inundation of moon jellyfish began on September 17th, 2011, and UESI divers were immediately deployed to begin cleaning the 5" barrier net. IRG biologists increased canal surveillance to 24 hours per day for a portion of this jellyfish event to ensure net integrity during overnight hours. The jellyfish intrusion lasted until October 7th, and the divers remained at the site until October 14th. At no point during this event was the 5" barrier net compromised.

On December 7th, 2011, during the beginning of a scheduled outage event, a 2 ft section of the secondary 8" A1A net was submerged 1" below the water line. The added stress on the net appeared to be from extremely high water levels due to the combined forces of outage conditions and normal tidal action. Two floats were added on December 7th to bring the net back to normal height, and no turtles were affected by this submergence because the primary 5" barrier net successfully confined turtles to the easternmost portion of the canal.

In 2011, routine quarterly inspections of the temporary 5-inch barrier net and the A1A net were completed. During these inspections debris was removed from both nets and a total of four holes were repaired in the 5" barrier net. There were no holes found in the A1A net.

3.3 Intake Pipe Cleaning and Maintenance

In October 2007, cleaning of the intake pipes and offshore intake structures began. Work inside the intake pipes required relatively calm seas and during October, November and December there were only a limited number of days where seas were at an acceptable level for diver safety. Despite weather days, the project managed to complete the cleaning of one 12' intake pipe and offshore structure housing it. Other work completed in 2007 included sealing off two pipe openings that extended from the top of the two 12' intake pipes. These pipe openings were approximately 100' eastward of the canal headwall and had originally been planned to be part of a back-flushing system that was abandoned during construction of the 12' intake pipes. These pipe openings were inspected and effectively sealed off.

During the refueling outage in April 2008, the cleaning of the south 12' intake pipe offshore structure and the removal of loose debris (concrete chunks, etc.) from both 12' intake structures was completed. The 16' pipe was cleaned during the Unit 1 refueling outage in 2010. The continued cleaning of the north 12' intake pipe, as well as concrete cutting and debris removal from the velocity cap, began in January 2011 and was completed in February 2011. An ROV inspection of the pipes was conducted on February 17th and 18th, which showed the pipes to be clean. June 2011 marked the closure of this project and all associated permits.

3.4 STSSN; Turtle Walks; Collaborative Efforts

As participants in the Sea Turtle Stranding and Salvage Network (STSSN), FPL's sea turtle biologists routinely respond to sea turtle strandings in St. Lucie and Martin Counties. This activity involves the collection of information on turtles that are found dead, debilitated, or that have been impacted by a human-related activity. The efforts of the Florida STSSN are

critical to the Florida Fish and Wildlife Conservation Commission (FFWCC) conservation and recovery program.

During 2011, IRG biologists responded to 41 stranding events in St. Lucie County. Eleven loggerhead, 27 green turtle, and 2 hawksbill strandings were documented. One additional stranding was documented but biologists were unable to determine the species. All 41 turtles were found in various stages of decomposition. Of these 41 turtles, the probable cause of death included three entanglement mortalities, two shark attacks, and eight boat strikes. The remaining 28 turtles were either too decomposed or had no visible wounds or abnormalities indicating a probable cause of death. Stranding reports for all 41 stranding events were submitted to the FFWCC.

Florida Power & Light Company conducts public service turtle walks on Hutchinson Island during the summer sea turtle nesting season. These turtle walks educate the public about relevant sea turtle protection issues and, in most cases, allow the viewing of a nesting loggerhead sea turtle. During 2011, FPL conducted 15 turtle walks between June 3rd and July 16th. During these programs a total of 486 people attended and on 11 of the 15 turtle walks they were able to view a nesting female loggerhead turtle.

IRG biologists at the St. Lucie power plant continued to collaborate with other researchers on five research projects in 2011. IRG biologists collected blood samples and biopsies from loggerheads to assist with a project conducted by University of Central Florida (UCF) biologists looking at stable isotope analysis in sub-adult and adult loggerheads. IRG biologists also collected blood samples from juvenile green turtles to assist in a separate study by UCF researchers seeking to identify the sex of juvenile green turtles via a host of blood parameters. Blood was taken from all loggerhead and green turtles captured in the canal to assist in a project conducted by Florida Atlantic University (FAU) researchers investigating the immune response in marine turtles to fibropapilloma tumors. Also, dorsal and lateral pictures were taken from all green sea turtles with an SSCL < 30cm to assist in a project conducted by a FAU researcher investigating changes in turtle shell morphology in relation to gape-limited predators. Lastly, IRG assisted the U.S. Geological Survey (USGS) with analysis for the Natural Resource Damage Assessment (NRDA) in response to the 2010

Deepwater Horizon oil spill. IRG biologists provided USGS with non-viable eggs from the excavation of seven marked loggerhead sea turtle nests.

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5.0 FIGURES

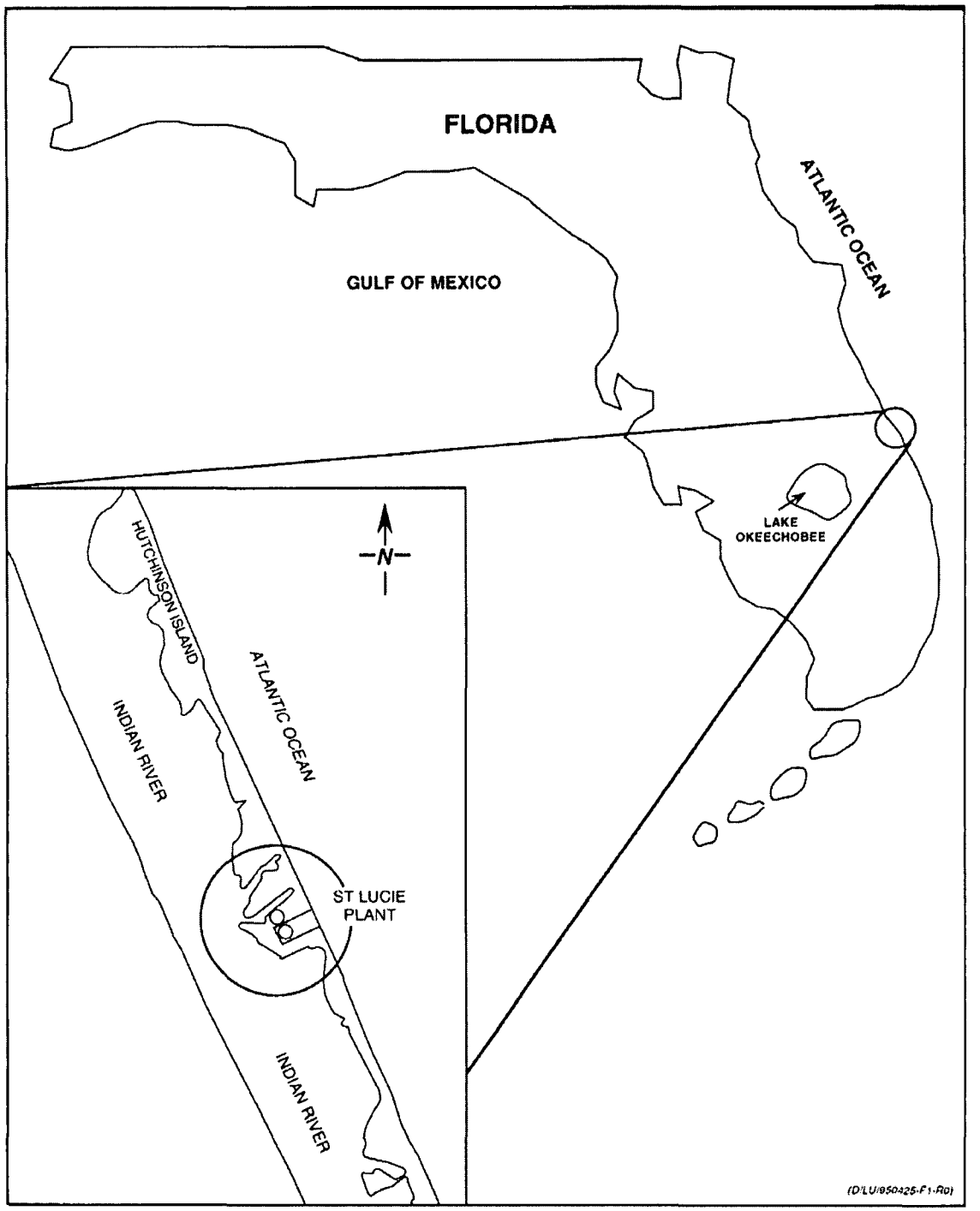

Figure 1. Location of St. Lucie Plant on Hutchinson Island, Florida.

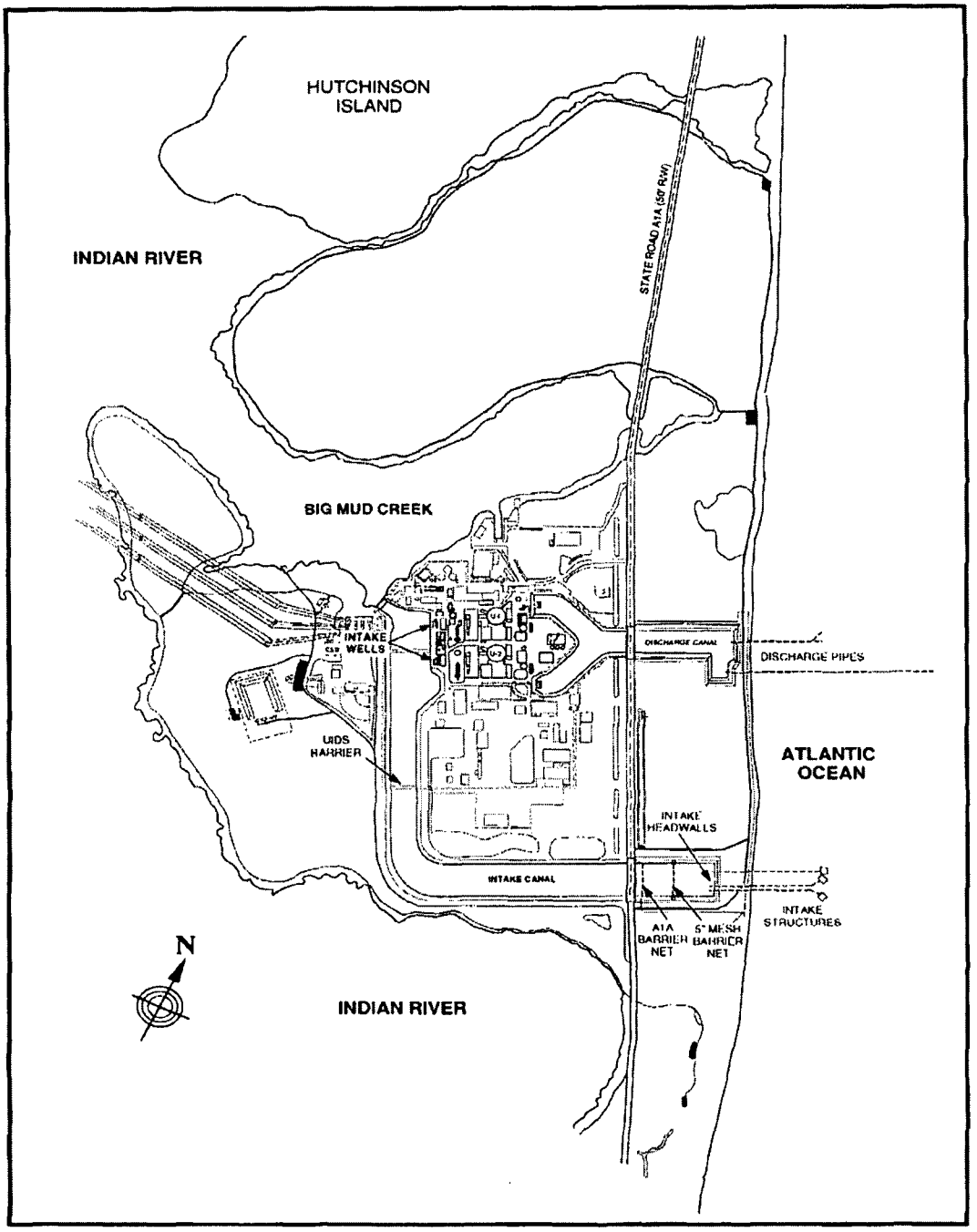

Figure 2. St. Lucie Plant cooling water intake and discharge system.

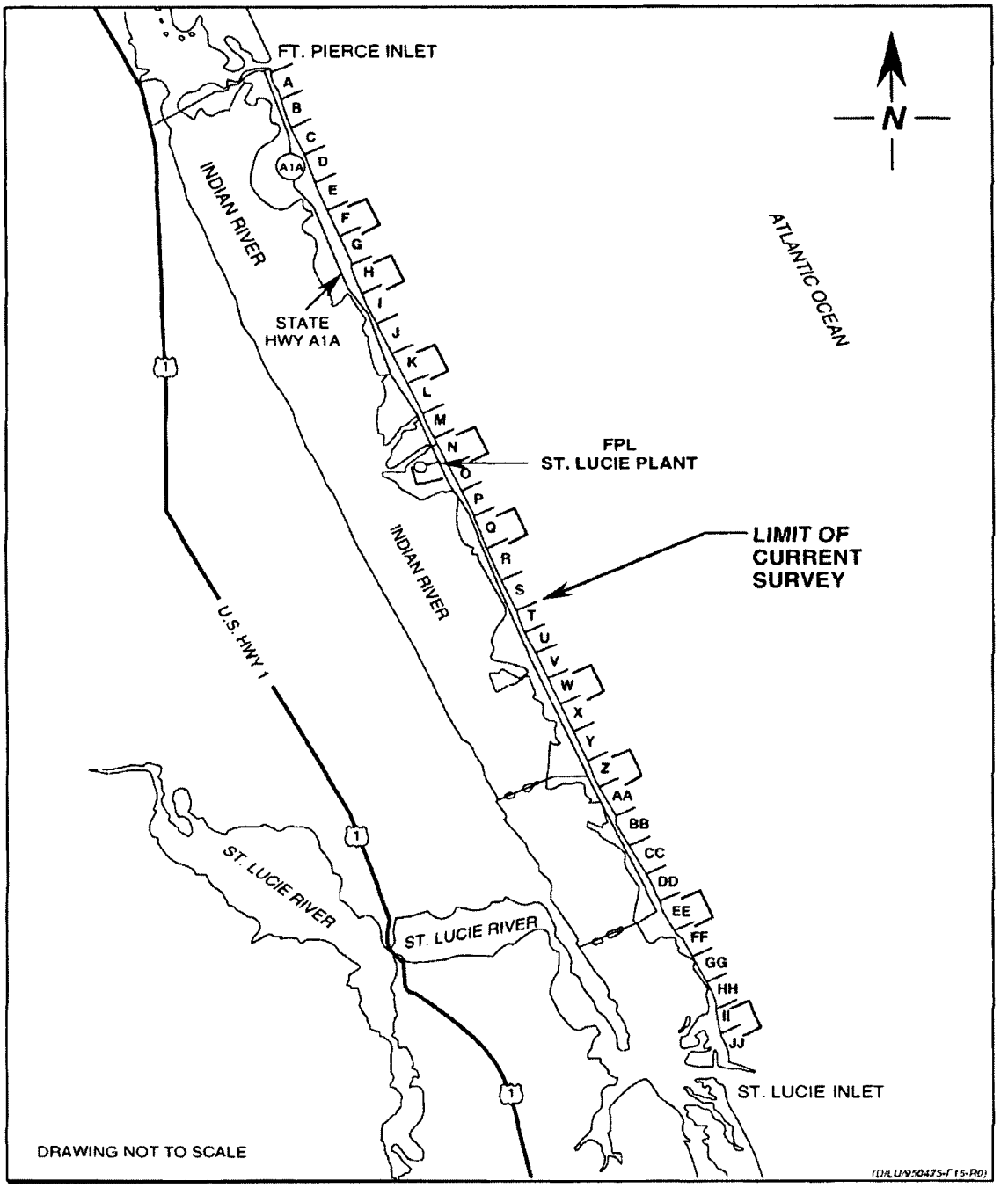

Figure 3. Designation and location of nine 1.25-Km segments and thirty-six 1-Km segments surveyed for sea turtle nesting, Hutchinson Island (1971-2011).

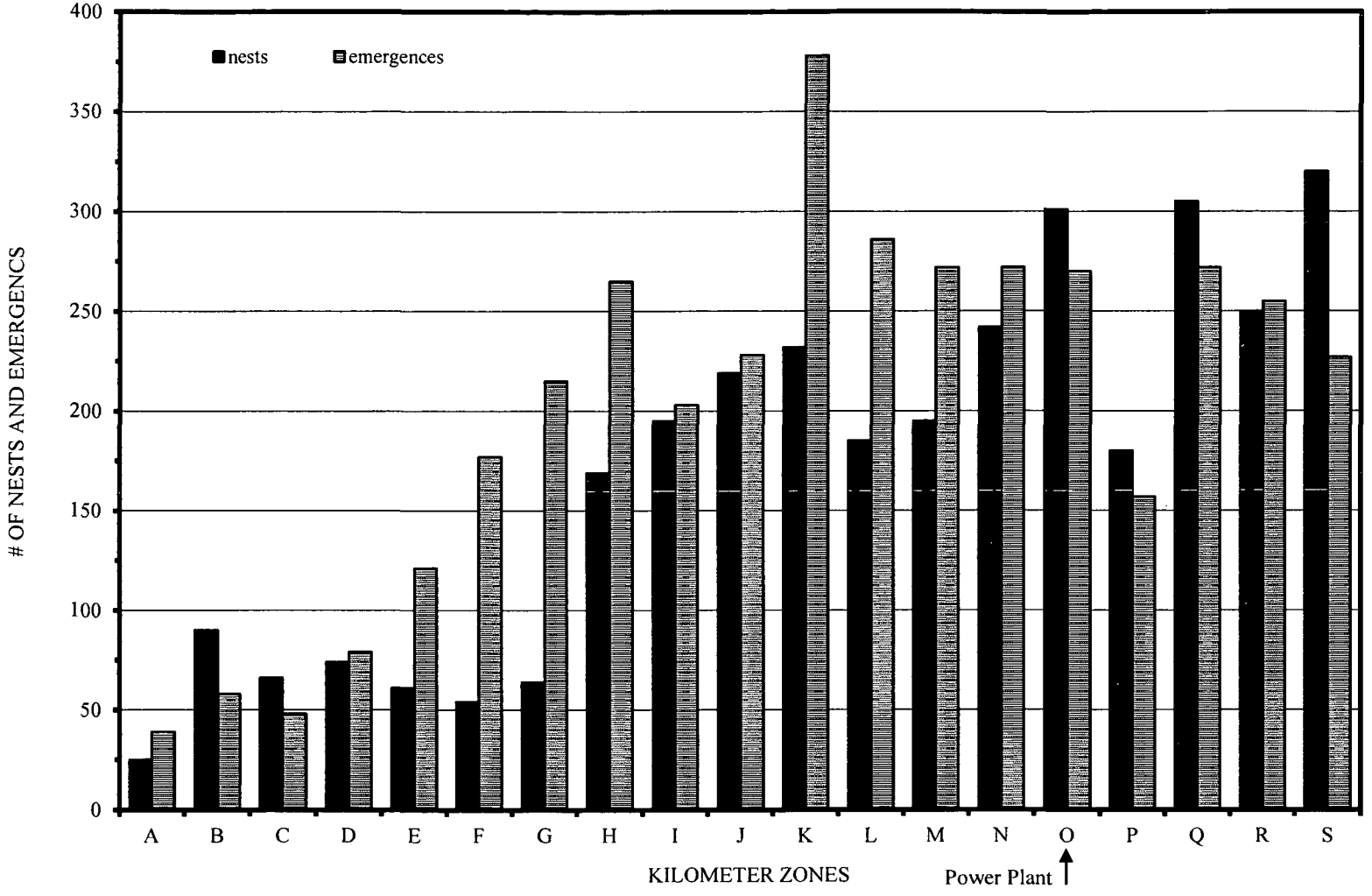

Figure 4. Number of loggerhead turtle nests and emergences for kilometer zones A through S (North to South), Hutchinson Island, April through September 2011.

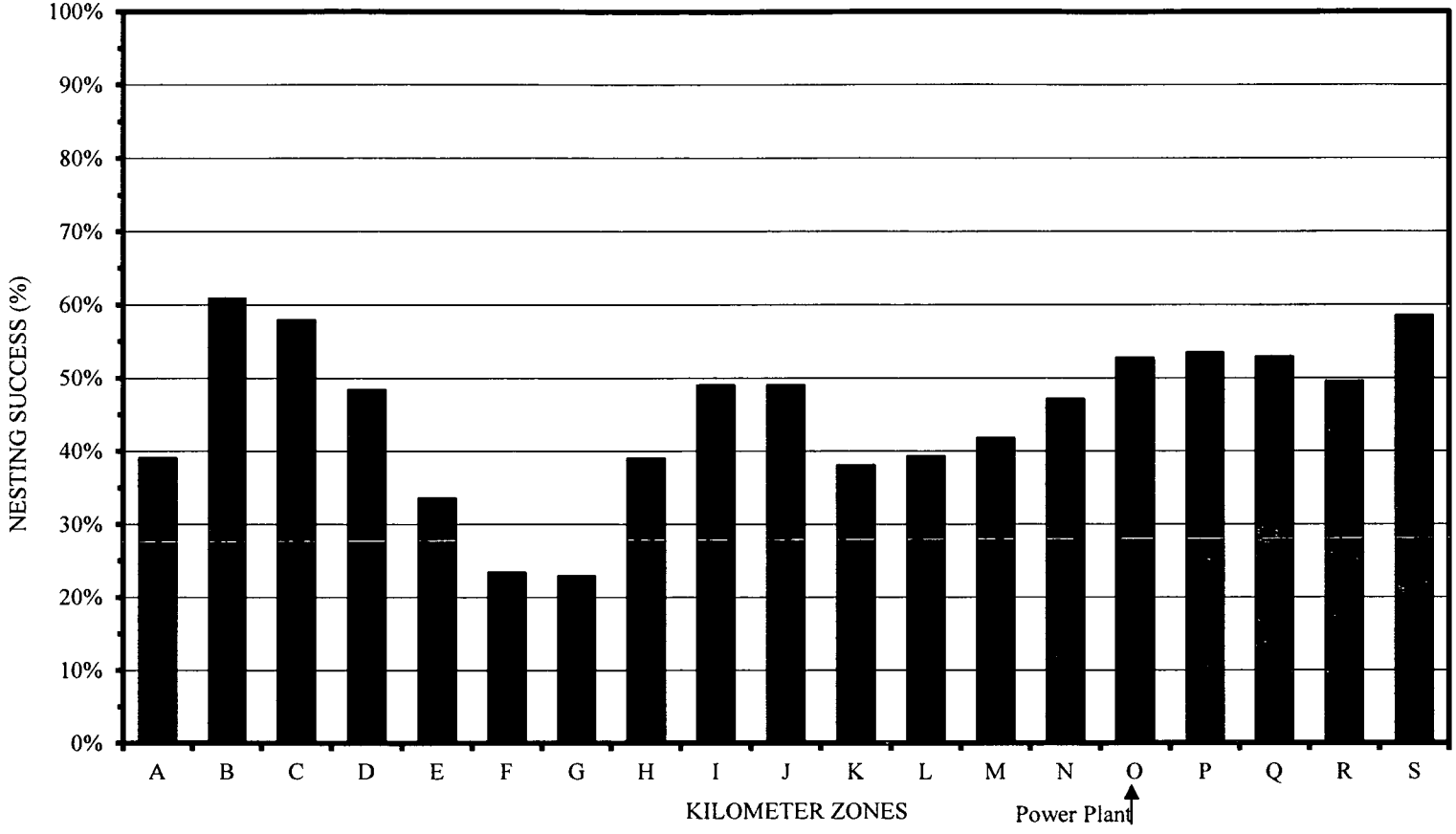

Figure 5. Loggerhead turtle nesting success (percentage of emergences resulting in nests) for kilometer zones A through S (North to South), Hutchinson Island, April through September 2011.

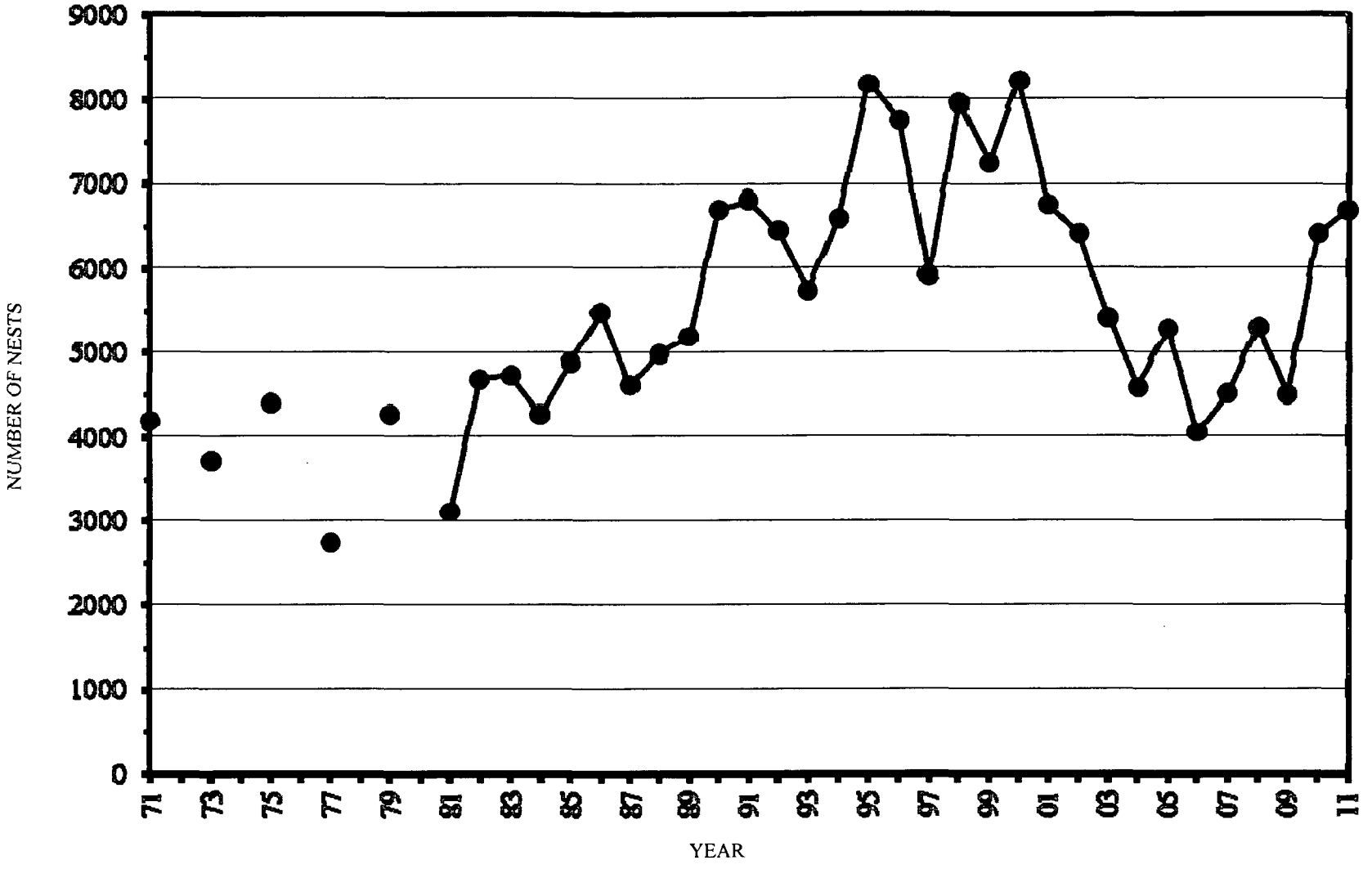

Figure 6. Number of loggerhead turtle nests, Hutchinson Island 1971 through 2011. Values for 1971 through 1979 are estimates (see text); values for 1981 through 2011 are from whole island surveys.

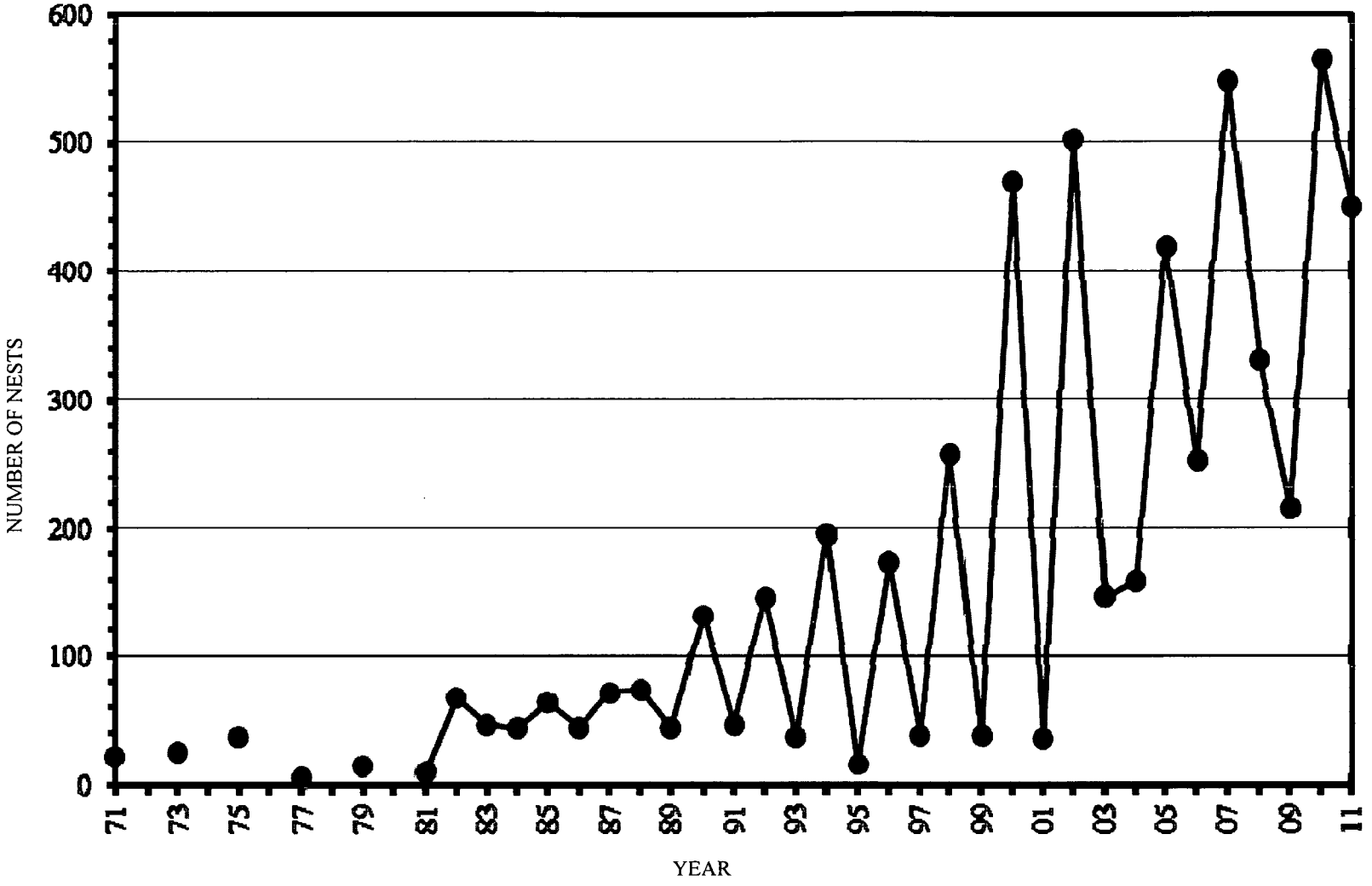

Figure 7. Number of green turtle nests, Hutchinson Island, 1971 through 2011. Values for 1971 through 1979 are estimates (see text) and values for 1981 through 2011 are from whole island surveys.

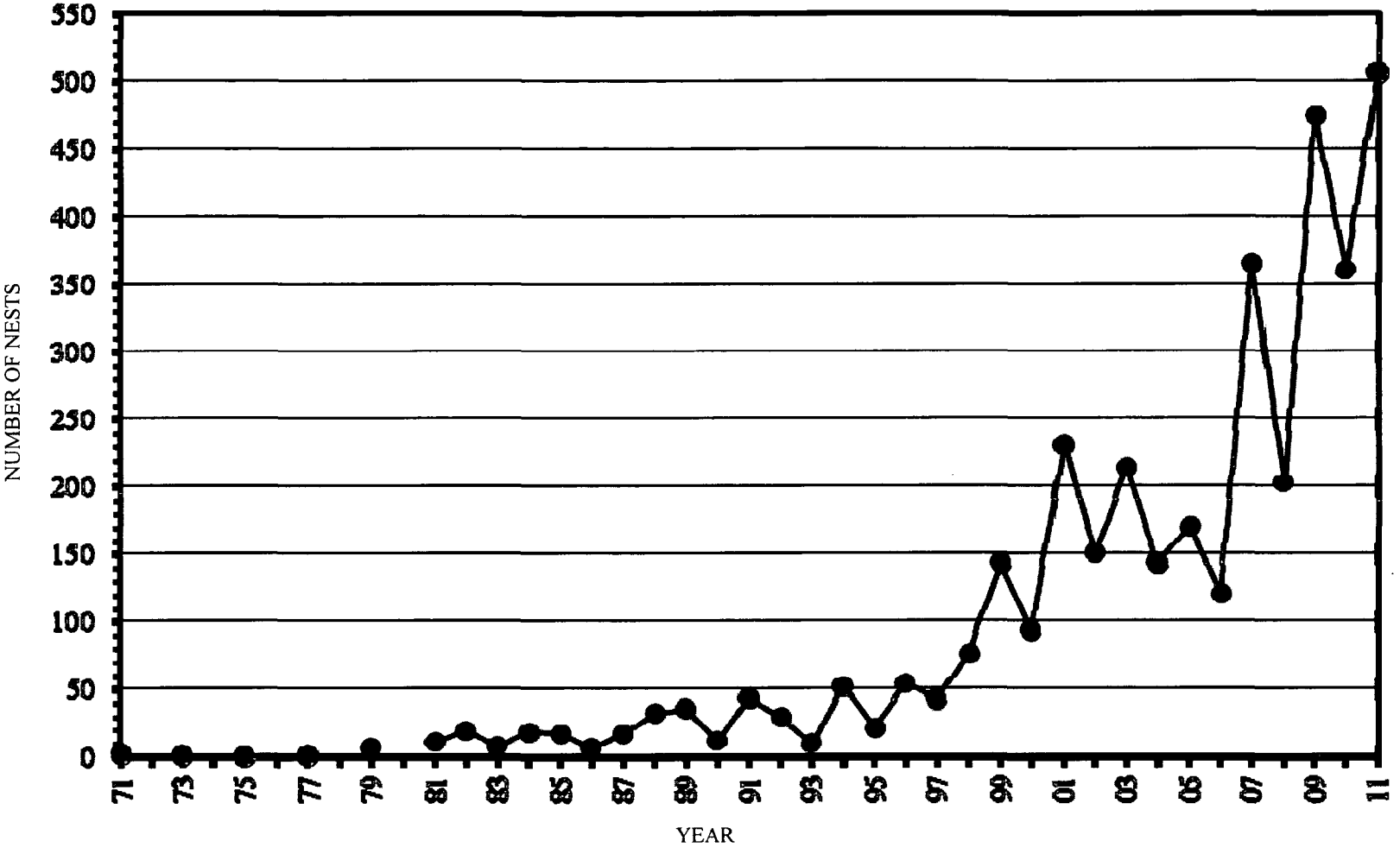

Figure 8. Number of leatherback turtle nests, Hutchinson Island, 1971 through 2011. Values for 1971 through 1979 are estimates (see text). Values for 1981 through 2011 are from whole island surveys.

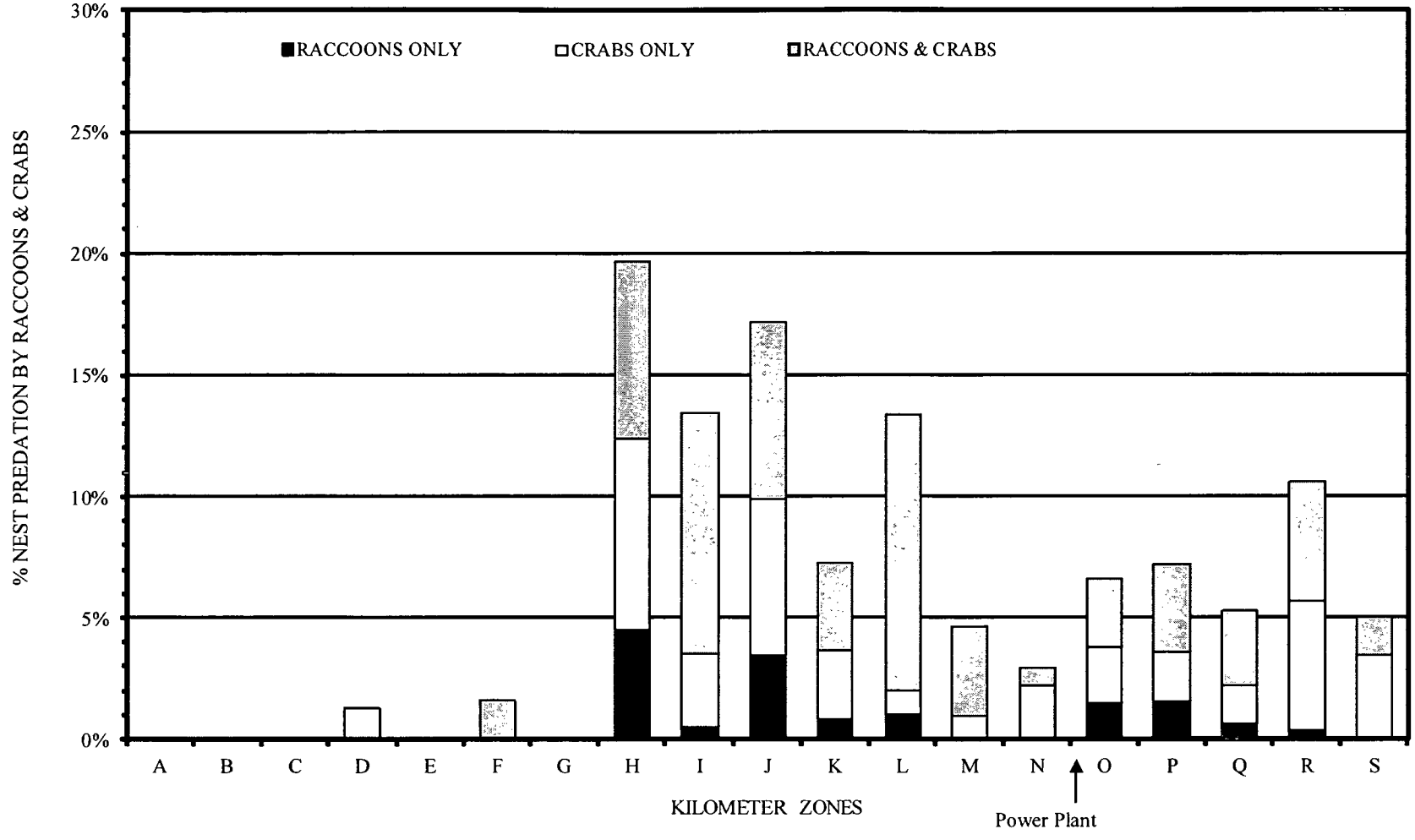

Figure 9. Percentage of sea turtle nests depredated by raccoons and/or ghost crabs in kilometer zones A through S (North to South) on South Hutchinson Island, April through September 2011.

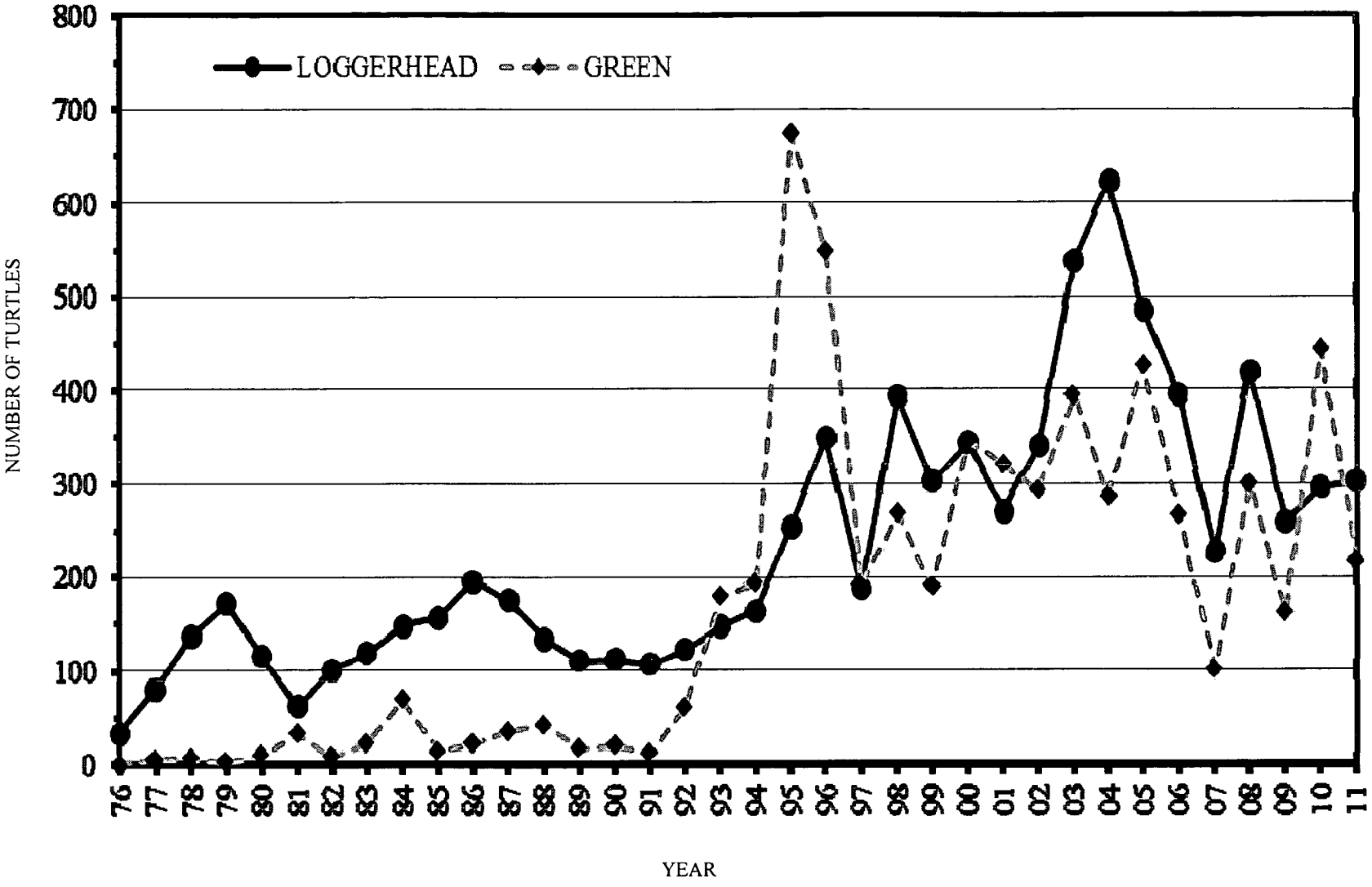

Figure 10. Number of loggerhead and green turtles removed each year from the intake canal at the St. Lucie Power Plant, 1976 through 2011.

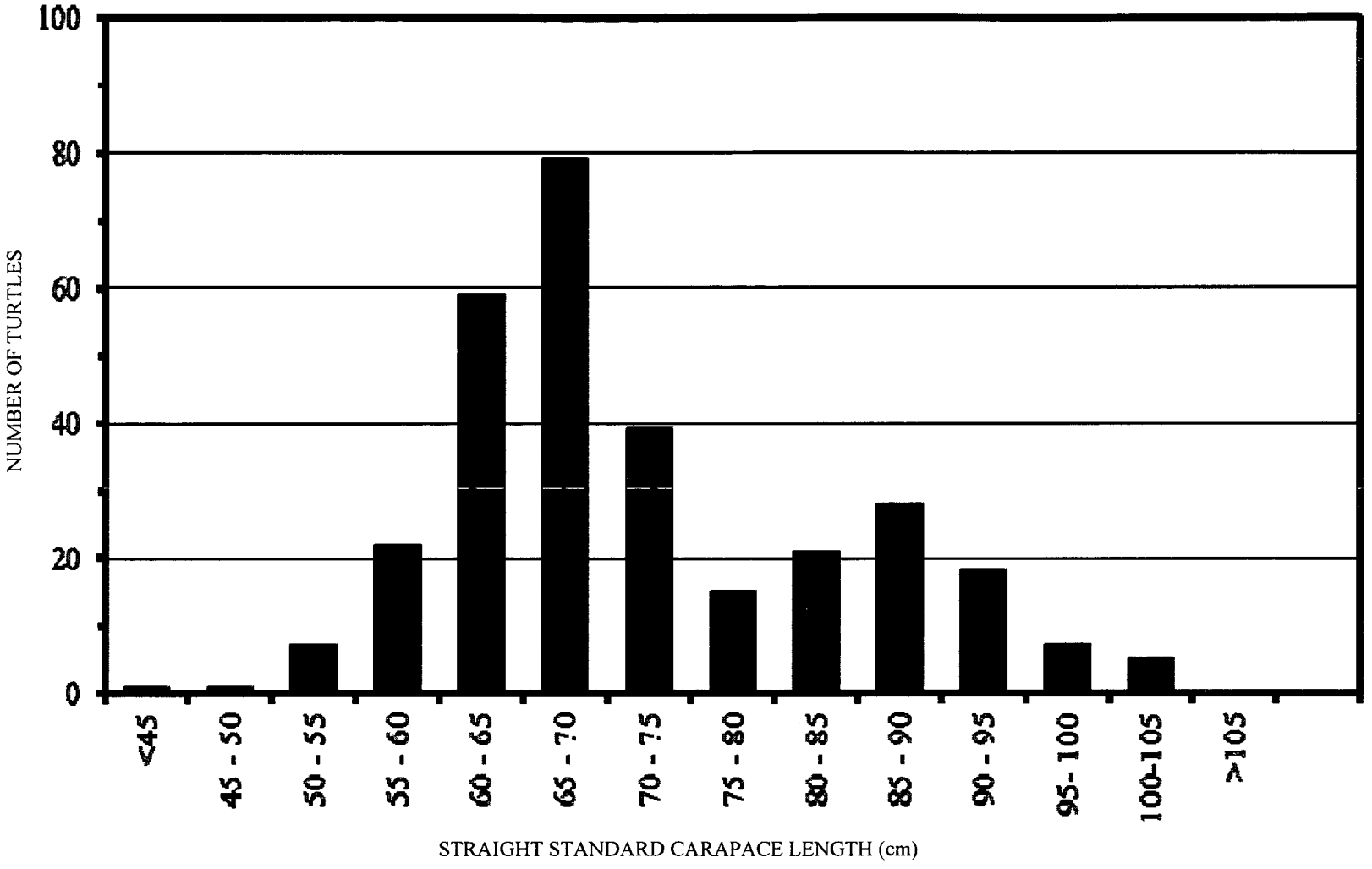

Figure 11. Size distribution (SSCL) of loggerhead turtles (n = 302) removed from the intake canal, St. Lucie Plant, 2011.

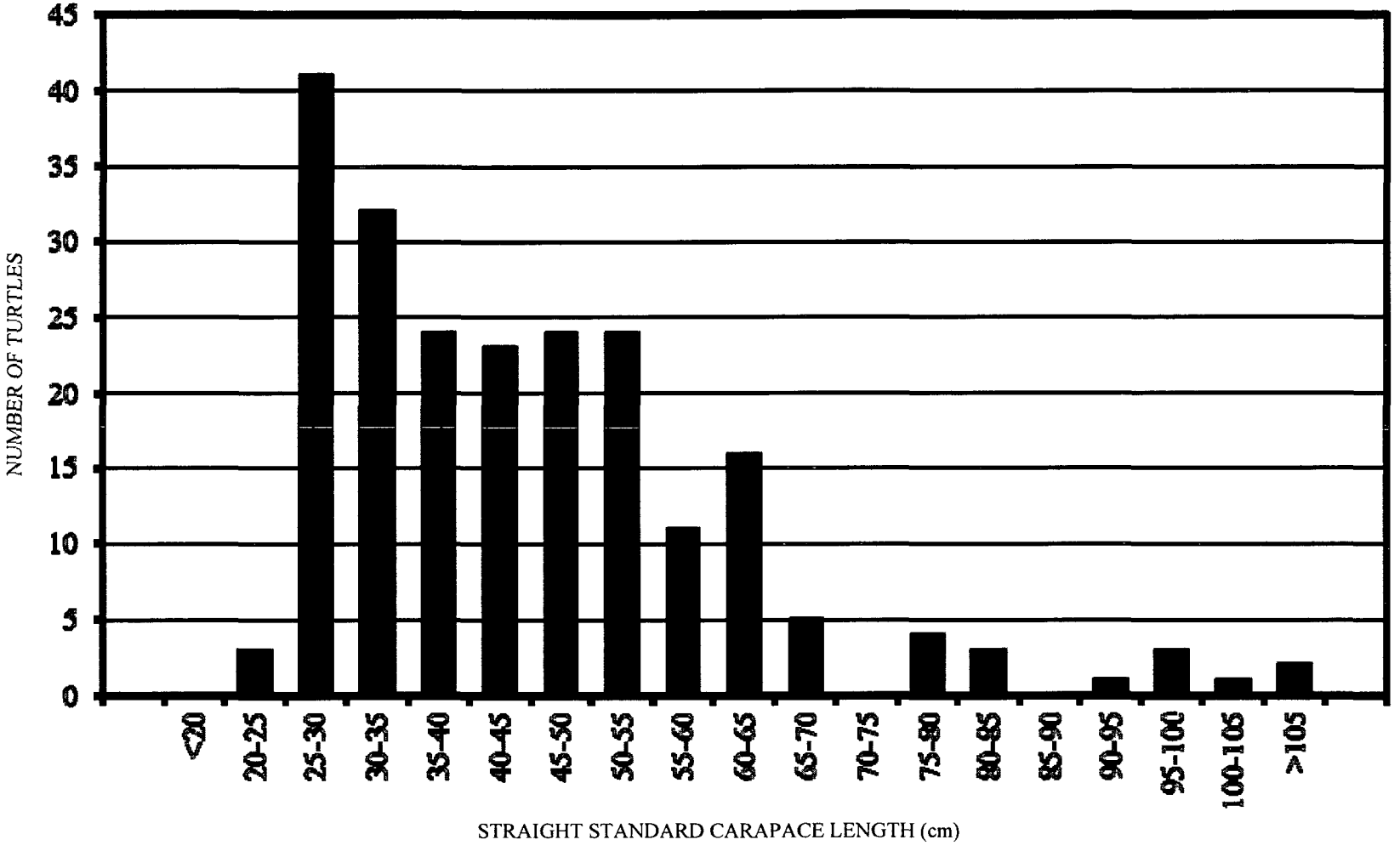

Figure 12. Size distribution (SSCL) of green turtles (n = 217) removed from the intake canal, St. Lucie Plant, 2011.

6.0 TABLES

Year	Species					Total
	Loggerhead	Green	Leatherback	Hawksbill	Kemp's ridley	
1976 - 1982	702 (67)	64 (9)	7	1	1	775 (76)
1983	119 (4)	23 (4)				142 (8)
1984	148 (3)	69 (2)		1	2	220 (5)
1985	157 (4)	14		1		172 (4)
1986	195 (27)	22 (1)	1	1	1	220 (28)
1987	175 (11)	35		2	6	218 (13)
1988	134 (6)	42 (2)			5 (2)	181 (10)
1989	111 (4)	17 (1)	1	2	2 (2)	133 (5)
1990	112 (1)	20 (2)				132 (3)
1991	107 (1)	12		1	1	121 (1)
1992	123 (2)	61 (2)	1	2		187 (4)
1993	147	179 (1)	5	2	4	337 (1)
1994	164	193 (4)	2		2	361 (4)
1995	254 (1)	673 (15)	1		5	933 (16)
1996	349 (3)	549 (4)		5	3	906 (7)
1997	188	191 (5)	2	1		382 (5)
1998	393 (1)	268	1	2	2	666 (1)
1999	302 (2)	190 (4)	1	1	1	495 (6)
2000	344 (2)	345 (2)		2		691 (4)
2001	270 (1)	321 (5)	2	6	1	600 (6)
2002	341	292 (3)		3		636 (3)
2003	538	394 (3)	4	6	2	944 (3)
2004	623 (2)	286 (1)	2	2	1	914 (3)
2005	484 (2)	428 (2)		2	3	917 (4)
2006	395 (1)	267 (2)	1	2	3	668 (3)**
2007	227 (3)	101 (1)	1	1		330 (4)
2008	420 (2)	299 (4)		4	2	725 (6)
2009	260 (1)	161 (1)	1	2		424 (2)
2010	295 (2)	444 (6)	2	3	7	750 (8)
2011	302 (1)	217 (8)		2		521 (9)
Total	**8379** (154)	**6177** (94)	**35**	**57**	**54** (4)	**14702** (252)
Annual Mean*	238.5	176.5	1.0	1.6	1.5	419.1

* Excludes 1976 (partial year of plant operation).

Table 1. Total number of captured turtles removed from the intake canal, St. Lucie Plant, 1976 through 2011. Number of mortalities is in parentheses.

Month	Number of Captures	Percent of All Captures	Minimum	Maximum	Mean	2011
January	797	9.50%	6	48	22.8	**13**
February	767	9.20%	5	38	21.9	**12**
March	910	10.90%	1	133	26	**16**
April	825	9.90%	0	71	23.6	**17**
May	731	8.80%	0	61	20.9	**43**
June	867	10.40%	3	66	24.8	**45**
July	1089	13.00%	0	124	31.1	**71**
August	725	8.70%	2	43	20.7	**13**
September	524	6.30%	1	49	15	**15**
October	400	4.80%	0	27	11.4	**23**
November	323	3.90%	0	18	9.2	**24**
December	388	4.60%	1	48	11.1	**10**
Total*	**8346**		**0**	**133**		**302**
Mean	695.5				19.9	25.2
Std. Deviation	236.4				6.8	18.5

* Excludes 33 loggerhead captures from 1976 (partial year)

Table 2. Total number of loggerhead turtles removed each month from the intake canal, St. Lucie Plant 1977 through 2011.

Month	Number of Captures	Percent of All Captures	Minimum	Maximum	Mean	2011
January	761	12.30%	0	61	23.8	**39**
February	662	10.70%	0	64	20.7	**8**
March	737	11.90%	0	147	23	**3**
April	455	7.40%	0	64	14.2	**7**
May	415	6.70%	0	91	13	**14**
June	386	6.20%	0	55	12.1	**7**
July	356	5.80%	0	61	11.1	**10**
August	372	6.00%	0	64	11.6	**1**
September	473	7.70%	0	77	14.8	**16**
October	595	9.60%	0	54	18.6	**49**
November	488	7.90%	0	50	15.3	**51**
December	477	7.70%	0	68	14.9	**12**
Total*	**6177**		**0**	**147**		**217**
Mean	514.8				16.1	18.1
Std. Deviation	140.7				4.4	17.8

* Excludes 1976 (partial year)

Table 3. Total number of green turtles removed each month from the intake canal, St. Lucie Plant, 1977 through 2011.

PART III

ANNUAL ENVIRONMENTAL OPERATING REPORT

1.0 INTRODUCTION

The St. Lucie Units 1 & 2 Environmental Protection Plans (EPP) require the submittal of an annual report for various activities at the plant site including the reporting on sea turtle monitoring programs, and other matters related to Federal and State environmental permits and certifications.

2.0 SEA TURTLE MONITORING AND ASSOCIATED ACTIVITIES

Surveillance and maintenance of the light screen to minimize sea turtle disorientation as required by Section 4.2.3 of the EPP is ongoing. The vegetation light screen located on the beach dune between the power plant and the ocean is routinely surveyed to determine its overall vitality. Evidence of sea turtle disorientation that occurs would also indicate any significant problems. Trees, vegetation or shade cloth are replaced as necessary to maintain the overall integrity of the light screen. Plant parking lot lighting is also designed and maintained to minimize light levels on the beach.

3.0 TAPROGGE CONDENSER TUBE CLEANING SYSTEM OPERATION

A Taprogge condenser tube cleaning system (CTCS) became operational on St. Lucie Unit 2 in January 1996 and on Unit 1 in July 1996. This system utilizes sponge balls, approximately 23 mm in diameter, to clean the condenser tubes through which seawater flows to cool steam after its pass through the plant's turbines. This system improves plant performance while reducing the need for chemical treatments such and biocides or chlorine to control biofouling.

Normally, the St. Lucie CTCS utilizes about 1800 sponge balls, which are continually re-circulated through each of four "water boxes" on each unit. These sponge balls are retained in

the system by a ball strainer located on the outlet of each water box. The ball strainers (mesh size 5 mm) are opened routinely to discharge debris, which can decrease flow and obstruct sponge ball movement through the system. The sponge balls are collected prior to opening, or back flushing, the ball strainers. At that time, the sponge balls are examined and replaced if they are worn to the point that they can no longer effectively clean the condenser tubes.

Sponge ball inventories and estimates of sponge ball loss to the environment have been performed since system start-up on both units. Number of ball strainer back flushes has also been tracked. In addition, daily beach surveys have been performed on plant property (approximately 2.5 miles) to note any sponge balls that may occur as a result of loss from the plant. This survey area has been extended during the turtle nesting season to almost 12 miles.

The results of the program for 2011 are presented in Table 1. Spikes in sponge ball loss have been identified as single events involving only one Unit. Four spikes in sponge ball loss were recorded in 2011. The first spike occurred on Unit 1 in February. The loss was the result of sponge balls being trapped in the system during system startup and shut down of the circulating water pumps while the site was dealing with seawater intrusion issues. Ball hideout in the system results in ball loss during system startup. The two additional ball loss spikes were observed in Unit 1, in June and November. The Unit 1 condenser tube cleaning system continues to see elevated losses as a result of wormrock growth and tube sheet liner degradation. While elevated ball losses were observed on Unit 1 throughout 2011, the prominent spikes are a collection moderate losses occurring on multiple water boxes within the same month. In 2011 system engineering documented excessive wormrock growth on water box tube sheet liners, a known cause of sponge balls deterioration and ball loss. System engineering also noted down tube water box coating degradation 2011. Deteriorated liners have been known to peel off in chunks collect on the strainers. The sponge balls become snagged on the strainer due do the excessive debris, and are lost during backwash. The remaining water boxes with degraded liners were inspected and cleaned during the Unit 1 refueling outage. The forth spike occurred on Unit 2 in November. The loss was attributed to prolonged use of the same balls and failure of the 2B2 ball collector.

The water boxes were operated based on system availability or system engineer recommendation. The Unit 1 system did not run in January for system trouble shooting and maintenance. Water boxes on Unit 1 were taken out of service in February and March for seawater intrusion mitigation. The Unit 1 system did not run from in November and December due to a scheduled maintenance outage. In August, a jellyfish intrusion event resulted in U1 shutdown and U2 down power. In response to the jellyfish intrusion, the Unit 1 and Unit 2 water boxes were taken out of service and the CTCS system remained in catch until November. The Unit 2 system did not run from January until June due to a scheduled maintenance outage. All of the water boxes were out of service at some point in the year for replacement of degraded pump pedestals.

Total sponge ball losses from Unit 1 were higher than Unit 2 in 2011. This was due to elevated losses throughout the year and peaks observed in February, June, and November on Unit 1. Elevated ball loss observed on Unit 1 were the result of worm rock growth on new tube sheet liners and old tube sheet liner peels collecting on the strainers. Only 4 sponge balls were found whole in the environment near the plant in 2011. This number indicates that few balls actually reach the environment whole.

Figure 1 indicates that estimated sponge ball loss for both units generally remained low throughout the year, with exception to the previously discussed events. Average daily ball loss in 2011 is slightly above the historic average, and indicates a decrease in losses as the tube sheet liner replacement project continues (Figure 2). Estimated sponge ball loss from both units was 22.9 balls per day for 2011. Average daily sponge ball loss since system start-up has been approximately 19 balls per day.

4.0 OTHER ROUTINE REPORTS

The following items for which reporting is required are listed by section number from the plant's Environmental Protection Plan:

5.4.1.2(a) EPP Noncompliance Incidents and Corrective Actions Taken

No incidents of noncompliance under EPP Section 5.4.1(a) were determined to have occurred during 2011.

5.4.1.2(b) Changes In Station Design or Operation, Tests, and Experiments in Accordance with EPP Subsection 3.1.

No plant site activities were determined to be reportable under Section 5.4.1(b) during 2011.

5.4.1.2(c) Non- routine Reports submitted to the NRC for the Year 2011 in Accordance with EPP Subsection 5.4.2

On January 11, 2011, St. Lucie Plant submitted to the NRC an Approved Revision of the Industrial Wastewater Facility Permit, initially approved by the State of Florida on December 17, 2010. Notification to the NRC occurred by FPL letter L-2011-014.

The 2010 Annual Environmental Operating Report was submitted to the NRC on April 20, 2011. Notification to the NRC occurred by FPL letter L-2011-147.

On May 10, 2011, St. Lucie submitted 316(b) related documentation to the NRC addressing responses to the St. Lucie Ambient Monitoring Report Feasibility Study required by Condition 14 of Administrative Order (AO) AO-022TL. The AO was a permit condition of a previous revision of the St. Lucie Plant Industrial Wastewater Facility Permit FL0002208. Notification to the NRC occurred by FPL letter L-2011-182.

On June 9, 2011, St. Lucie submitted additional 316(b) documentation pertaining to the St. Lucie Biological Plan of Study previously addressed in the AO-022TL included in a revision to the St. Lucie Plant Industrial Wastewater Facility Permit

FL0002208. The NRC was notified of this request by FPL letter L-2011-217.

On August 1, 2011, a dead juvenile green sea turtle (Chelonian mydas) was recovered from the St. Lucie Plant Intake Cooling Canal 5-inch turtle barrier net. The final necropsy identified many underlying health issues as contributors for the turtle mortality. Since a clear cause of death was not determined and the final necropsy report did not identify a specific mortality determination FPL has conservatively classified this mortality as causal to plant operations. The NRC was notified on August 11, 2011, by FPL letter L-2011-321.

On August 20, 2011, St. Lucie Plant experienced a Reportable Fish Kill in the St. Lucie Plant Intake Cooling Canal. The event occurred during a jellyfish intrusion event that impacted the resident fish population. The NRC was notified on September 20, 2011, by FPL letter L-2011-397.

On October 20, 2011, St. Lucie submitted to the NRC the Final Revised Industrial Wastewater Facility Permit FL0002208 issued by the State of Florida on September 29, 2011. The NRC was notified by FPL letter L-2011-450.

On December 3, 2011, a dead female juvenile green sea turtle (Chelonia mydas) was recovered from the St. Lucie Plant Intake Cooling Canal 5-inch turtle barrier net. The preliminary necropsy was that the mortality was due to drowning and causal to plant operations. The NRC was notified on December 20, 2011, by FPL letter L-2011-558.

TABLE 1

2011 ST. LUCIE PLANT CONDENSER TUBE CLEANING

SYSTEM SUMMARY

	Strainer Back Flushes		Estimated Ball Loss		Balls Found On Beach
Month	Unit 1	Unit 2	Unit 1	Unit 2	
January	1	0#	0	0	0
February	9	0#	1566	0	1
March	5	0#	600	0	1
April	10	0#	107	0	0
May	14	1#	101	117	0
June	16	7	1683	174	1
July	8	8	638	97	0
August	9	8	579	10	1
September	0	5	0	108	0
October	0	5	0	56	0
November	5##	14	1166	1138*	0
December	0##	15	0	241	0
Total	77	63	6440	1941	0

\# Unit 2 system shutdown during refueling, 1/03/11 to 5/23/11.
Unit 1 system shut down during refueling, 11/27/11 into 2012
* Loss of abrasive balls.

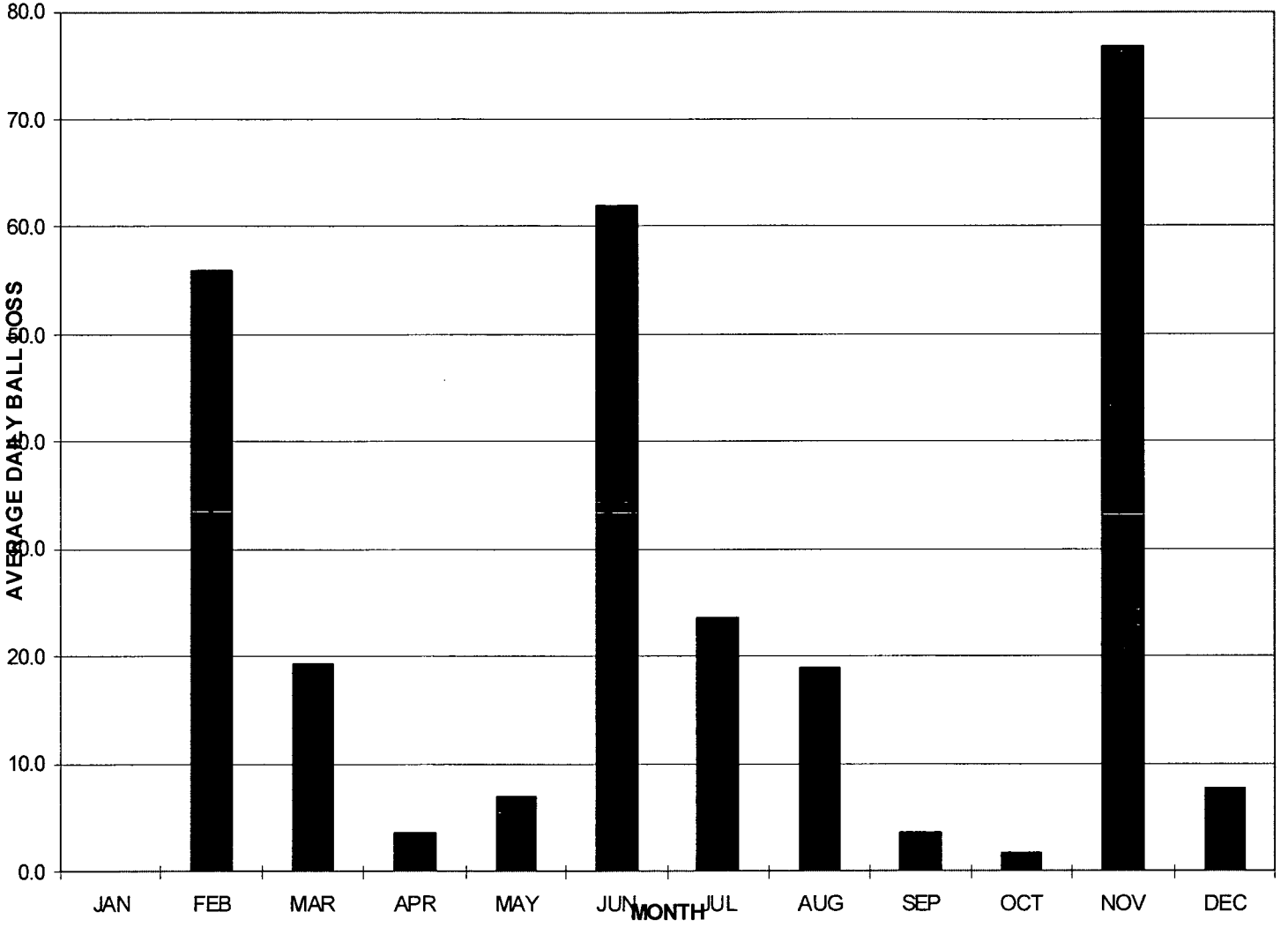

Figure 1. Estimated Average Daily Sponge Ball Loss by Month from St. Lucie Plant (Both Units) for 2011.

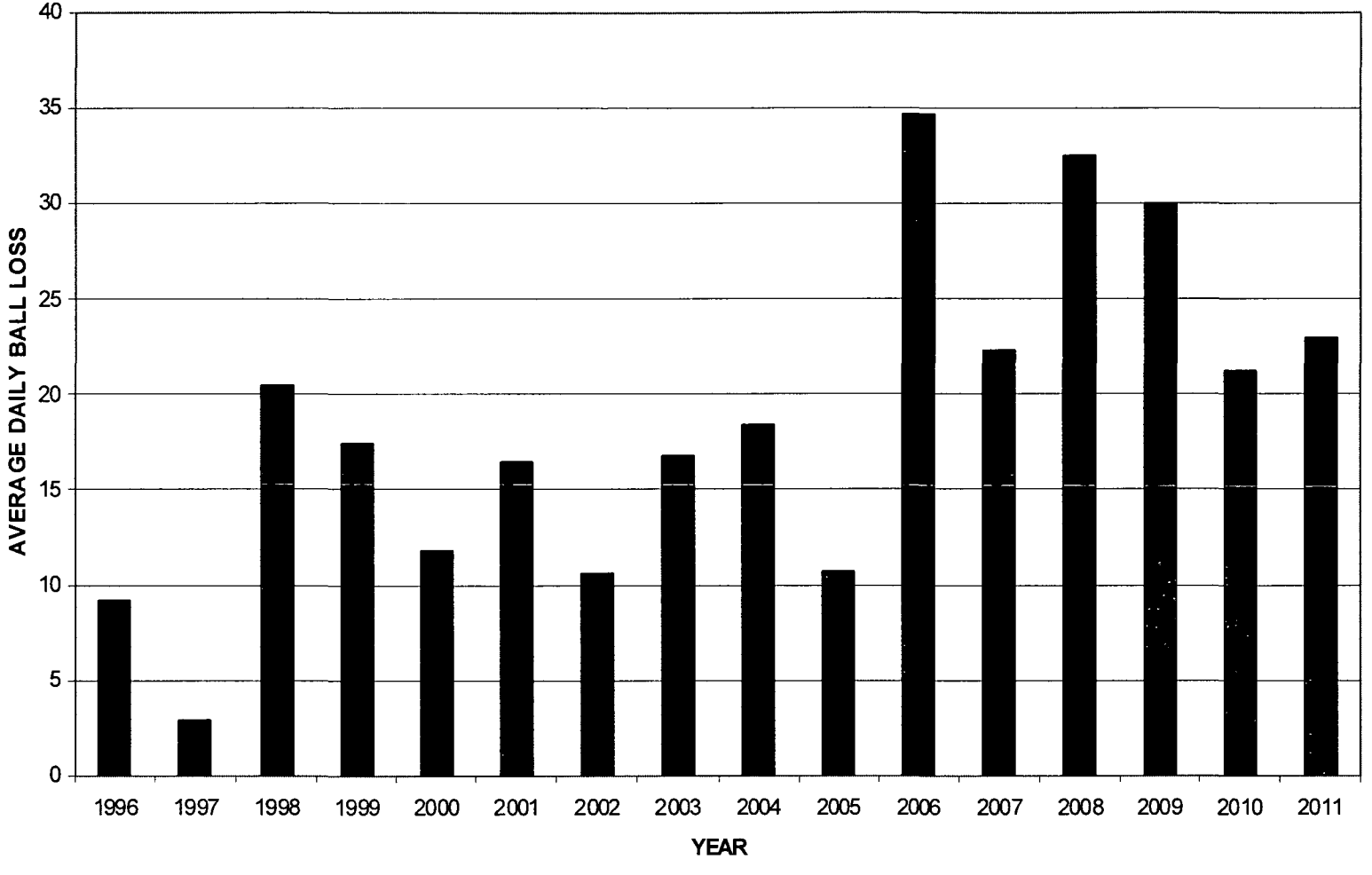

Figure 2. Average Daily Sponge Ball Loss from the St. Lucie Plant (Both Units) Since System Start-Up (January 1996).